THE FUNGI OF MANITOBA

BY

G. R. BISBY

A. H. REGINALD BULLER

AND

JOHN DEARNESS

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THE FUNGI OF MANITOBA

WORKS BY

A. H. REGINALD BULLER, D.Sc., Ph.D.

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THE
FUNGI OF MANITOBA

BY

G. R. BISBY
PH.D.; PROFESSOR OF PHYTOPATHOLOGY AT THE UNIVERSITY OF MANITOBA

A. H. REGINALD BULLER
D.SC., PH.D., LL.D., F.R.S., F.R.S.C.; PROFESSOR OF BOTANY AT THE UNIVERSITY OF MANITOBA

AND

JOHN DEARNESS
M.A., LL.D.; FORMERLY PROFESSOR OF BIOLOGY AT THE UNIVERSITY OF WESTERN ONTARIO AND PRINCIPAL OF THE NORMAL SCHOOL AT LONDON, ONTARIO

WITH A PREFACE BY E. J. BUTLER, F.R.S.
DIRECTOR OF THE IMPERIAL BUREAU OF MYCOLOGY AT KEW, ENGLAND

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PREFACE

In accepting with the greatest pleasure the invitation to contribute a preface to this book my excuses, though not any justification, are that one of the authors, G. R. Bisby, helped me in strenuous times in starting the Imperial Bureau of Mycology, that of another, A. H. R. Buller, I have long admired the many-sided activities, and that Dr. Dearness must occupy a very special place in the appreciation of all mycologists in the British Empire. It would have been easy to select someone better fitted to do so from familiarity with the subject, but not so easy to find one more sincerely convinced of its importance than I am. Knowledge of the fungus flora of a region appears to me to be the foundation of all mycological work in that region, applied as well as pure; but it is not to be gained in a few months, even in the older countries where most of the fungi have already been collected and named. Such a list as that contained in the following pages is, when based as this is on personal study, an expression of work, arduous and extensive beyond what is readily realized. It postulates a knowledge of every group represented. The authors, indeed, form a team, each member with special competence in different parts of the undertaking. They form too an interesting combination of the amateur, to whom the study of the fungi has been a hobby during a long lifetime, the eclectic university professor probing the inner

71784

secrets of these plants, and the worker in the field of applied mycology. The result is much more than a mere catalogue of the fungi of Manitoba ; its value is multiplied by the notes on many of the species and by the discussions on plant geography, ecology, distribution, seasonal prevalence, habitat, and the like in the early sections, and the host and substratum indices at the end, the latter being of particular interest and likely to increase greatly the utility of the book as a field manual.

The systematic study of the fungi in the Dominions and Colonies of the British Empire has been, with some striking exceptions, much neglected. It began well, for the founders of British mycology in the last century devoted much time to the study of material received in England from collectors overseas. Then there was a long period of depression, due partly to a recognition of the imperfections of determinations based on chance collections in only partially explored areas, but more to the absence of good herbaria and other facilities for naming species in the regions concerned. It is only since the beginning of the present century that the attempt has been made in certain areas to surmount these difficulties. In Ceylon, South Africa, Australia, and elsewhere, herbaria with good named collections have been built up, and in some of these areas the fungi are, or are becoming, fairly well known. The publication of the present list will place Manitoba at the head of these. The determination of approximately 2,000 species in a region with so relatively scanty and uniform a plant cover and so rigorous a climate probably indicates that a higher percentage of the whole of the fungi present has been found than has been the case elsewhere—and incidentally helps towards a realization of the probable richness in species of fungi of regions more congenial to their growth. In Manitoba the fungi are already twice as numerous as the flowering plants, and Manitoba is not likely to be exceptional in this respect, though it appears to be the first of the overseas States to establish the fact.

The utility of regional lists of fungi is manifold. Not only is mycology a field, and not the least interesting, for nature study in which, however, the prospective student is hampered unless he can obtain in convenient form an indication of what he should seek ; but the scientific and the economic worker each has a need for such lists. Botanical science as a whole is bound to profit from a more exact knowledge of the geographical distribution, ecology, phenology, and habitats of the fungi. Still greater is the need of the applied mycologist or plant pathologist for detailed information regarding the fungus flora of the region in which he works and, to a certain extent also, of regions from which dangerous fungi might be introduced. Until recently the destructive downy mildew of the hop was only known to be indigenous to Japan and Wisconsin. Within the past year it has been found attacking cultivated hops in British Columbia, and from the reference to it in the following list it appears that it is an indigenous Manitoban fungus. The possible significance of this extension of the known natural range of the parasite is obvious. No doubt, too, the notes on the rare or absent species and on those that, perhaps, find in Manitoba their northernmost limits of distribution are capable of an economic application of considerable practical importance. These are only a few of the many reasons why this list of the fungi of Manitoba is deserving of a warm welcome not alone within the

Province, but by mycologists in many other parts of the world. One may be permitted to hope that some of those whose opportunities lie in the less explored regions will be inspired to attempt a similar service to that which the authors of this book have so well performed.

E. J. BUTLER.

TABLE OF CONTENTS

Preface, by E. J. Butler, F.R.S.

SECTION PAGE
I. Introduction 1
II. The Natural Features of Manitoba 6
III. Geographical Distribution . . 9
IV. The Fungi of Particular Areas . 15
V. Immigration and Ecology . . 19
VI. Coprophilous Fungi . . . 24
VII. New Species 28
VIII. Rare Species 30
IX. Fungi Apparently Absent . . 32
X. Estimates of the Total Number of Species of Fungi in Manitoba . 34
XI. Statistical Summary . . . 36
XII. History of Observations on the Fungi of Manitoba . . . 38
XIII. The Groups of Fungi and Acknowledgments for Assistance in Determining Species . . . 41
XIV. List of Species :
- Myxomycetes 51
- Bacteria 54
- Phycomycetes 55
- Ascomycetes 57

CONTENTS

SECTION PAGE

Basidiomycetes 80
Fungi Imperfecti 122
Fungi on Man and Higher Animals observed at Winnipeg, by A. M. Davidson 145

XV. The Lichens of Manitoba, by Kirk Scott Wright 147

XVI. Index of Hosts or Substrata of Caulicolous and Lignicolous Fungi 153

XVII. Host Index of Parasitic Fungi:
Part I. Parasites of Cultivated Plants 162
Part II. Parasites of Plants Growing without Cultivation 167

XVIII. Bibliography:
Part I. General 181
Part II. Publications treating of Manitoba Fungi by Mycologists other than those at the Dominion Rust Research Laboratory 182
Part III. Publications from the Dominion Rust Research Laboratory, Winnipeg . . 185

XIX. Index of Classes, Orders, Families, and Genera 187

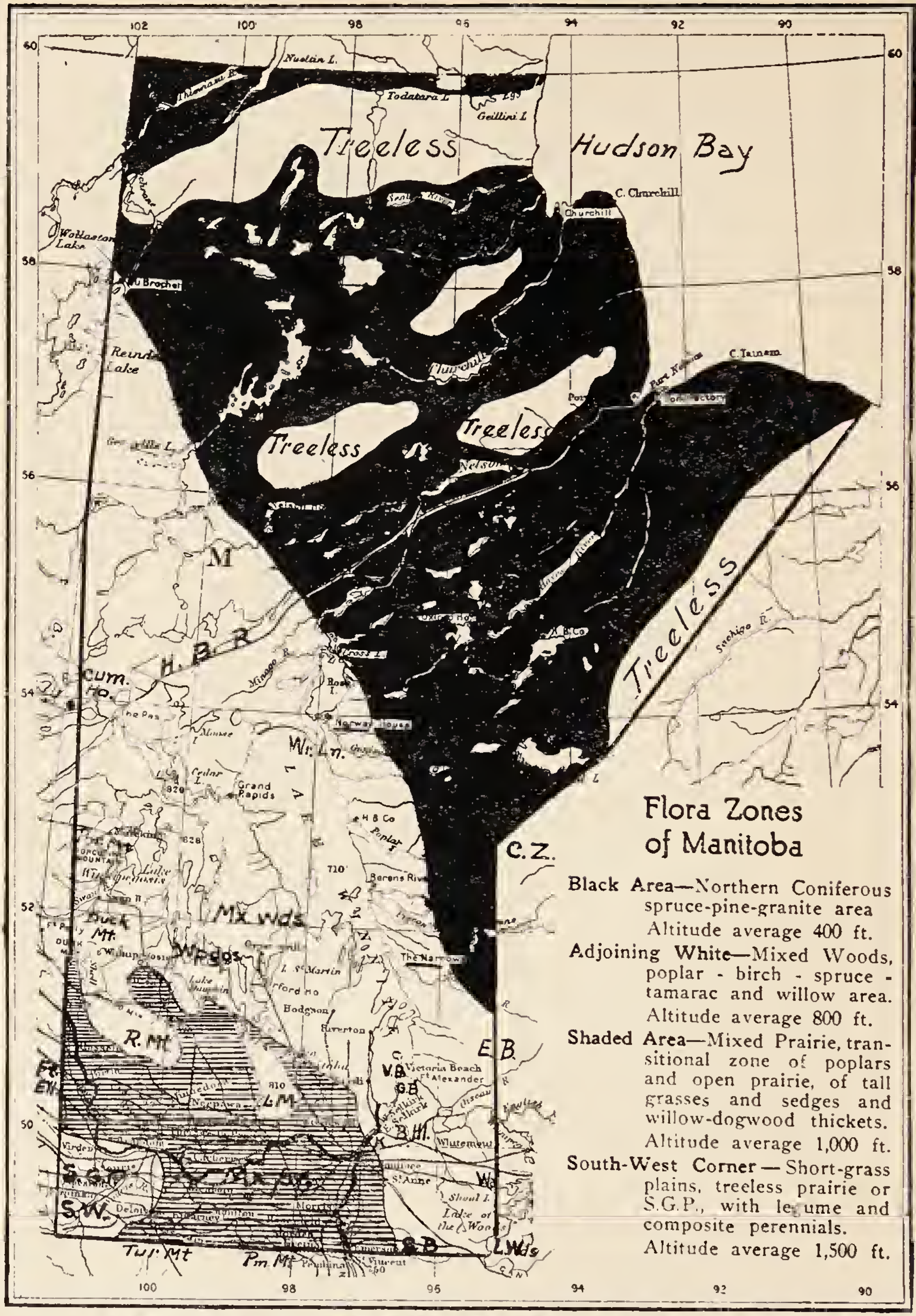
Flora Zones of Manitoba
Black Area—Northern Coniferous spruce-pine-granite area Altitude average 400 ft.
Adjoining White—Mixed Woods, poplar - birch - spruce - tamarac and willow area. Altitude average 800 ft.
Shaded Area—Mixed Prairie, transitional zone of poplars and open prairie, of tall grasses and sedges and willow-dogwood thickets. Altitude average 1,000 ft.
South-West Corner — Short-grass plains, treeless prairie or S.G.P., with legume and composite perennials. Altitude average 1,500 ft.
Treeless
Hudson Bay
Treeless
Treeless
Treeless
C. Churchill
Churchill
C. Tatnam
Nueltin L.
Wollaston Lake
Reindeer Lake
H. B. R.
M
Cum. Ho.
The Pas
Wr. Ln.
Norway House
Grand Rapids
Cedar L.
Mx. wds
Woods
Duck Mt.
R. Mt.
L. M.
C. Z.
E. B.
V. B.
G. B.
B. Ht.
S. G. P.
S. W.
Tur. Mt
Pm. Mt
S. B.
L. Wds
Victoria Beach
The Narrows
Berens River
Bodgson
Riverton
St. Anne
Shoal L.
Lake of the Woods
Emerson
Lake Winnipegosis
Lake Manitoba
102
100
98
96
94
92
90
60
58
56
54
52
50

FIG. 1.—Map showing the Floral Zones of Manitoba. Winnipeg (near the base of the map) lies almost on the eastern edge of the shaded area at the confluence of two rivers (50° N., 97° W.). Minaki and Kenora (not marked) are on the two railway lines which run eastward from southern Manitoba (near base of map on right-hand side). Norway House and Victoria Beach (both marked) are on Lake Winnipeg, at the north end and south end respectively. Brandon and Carberry (faintly marked in the shaded area) are near 50° N. and 100° W. Swan River is in the west of the Province, just north of 52°. Map by courtesy of V. W. Jackson.

FUNGI OF MANITOBA

I.

INTRODUCTION.

Canada, as is well known, is a large country, its area being slightly greater than that of its southern neighbour, the United States. Much of it has been settled only in the last few decades, and there are tens of thousands of square miles within its boundaries in which, up to the present, no botanist has ever set foot.

The University of Manitoba, of which two of the authors are members, established its Chair of Botany in the year 1904: and, since then, Saskatchewan, Alberta, and British Columbia, in succession, have each founded a provincial university provided with a Chair of Botany. As a result of the development of all these academic institutions a number of professional botanists have become resident in western Canada, and the time has now come when it is possible to begin a botanical survey of the huge territory lying to the north of the forty-ninth parallel of latitude and west of the Great Lakes. This survey is a task of great magnitude which must necessarily require the united efforts of many workers, both professional and amateur, for a long series of years.

Towards the accomplishment of such a botanical survey as that just suggested the authors[1] have made a study of the fungi of Manitoba, an account of which is included in the following pages. It is their hope that this contribution may not only advance the cause of pure Botany as envisaged by the mycologist, the ecologist, and the student of plant distribution, but that it may also prove of service to those phytopathologists who are engaged in the important work of combating plant diseases within the three great prairie Provinces of Manitoba, Saskatchewan, and Alberta.

An attempt has been made to give a complete census of the known fungi of Manitoba. There can be no doubt that many other species which occur in the Province still remain to be discovered and that the List of Species must therefore be incomplete. However, the preparation of the List has involved much labour and no effort has been spared to make it as accurate as possible. We trust that, as a result of this publication, new workers will be attracted to the study of the fungi of western Canada.

---

[1] The authors' names are placed in alphabetical order. John Dearness of London, Ontario, has examined the material of several hundred species herein recorded. His wide and practical knowledge of Canadian fungi, reinforced by his large herbarium for comparison, has been of great assistance in accurately determining the more difficult species. A. H. R. Buller has studied the fungi of Manitoba for a quarter of a century and has published many critical observations on them. His familiarity with the fungi of Great Britain and other European countries has enabled him to make comparisons between many Canadian and Old World species.

In co-operation with his co-authors, G. R. Bisby has acted as editor. Moreover, he has collected, or assisted in collecting, most of the species named and has had the opportunity of examining nearly all the specimens found by others and here recorded. From the first, he has borne the responsibility of determining the species or, in case of doubt, of obtaining assistance in their determination. Most of the material upon which the List of Species is based has been examined by at least two of the three authors.

The authors desire to express their appreciation to the National Research Council of Canada and to the University of Manitoba for support of the investigations recorded in this volume, which may be regarded as a contribution to the proposed Botanical Survey of Canada.

The authors desire to express their best thanks to many contributory workers, in particular to those specialists who are mentioned in Section XIII in connection with the groups of fungi in which they are interested. From the first, Professor V. W. Jackson of the Manitoba Agricultural College has given willing and valuable assistance in settling the identification of certain host plants. The members of the Dominion Rust Research Laboratory, Winnipeg, have shown constant interest and have helped with the work in many ways. As evidence thereof, the names of Dr. Margaret Newton and of Messrs. I. L. Conners, W. L. Gordon, W. F. Hanna, T. Johnson, J. H. Craigie, and D. L. Bailey are frequently entered in the collectors' data and notes on the covers of the specimens. Professor W. P. Fraser, now of the University of Saskatchewan, collected and reported the names of many of the Uredinales. Although full data in respect to the various collectors are recorded on every herbarium packet, it has not been thought necessary to include them in the List of Species as here published except where a collector, other than the authors, has supplied all the material and data.

The new species of Manitoban fungi, published either in this volume or elsewhere, have their co-types in the Manitoba Agricultural College herbarium. Most of the types are in the herbarium of John Dearness at London, Ontario. Dr. E. A. Burt of the Missouri Botanical Garden at St. Louis, Missouri, has the types of two Thelephoraceae. The herbarium of Dr. J. J. Davis at Madison, Wisconsin, and that of the late C. G. Lloyd of Cincinnati (his herbarium has now been removed to Washington, D.C.) each contain a single type. Dr. W. F. Hanna has his new species of Sporobolomyces in culture at the Dominion Rust Research Laboratory at Winnipeg. The new species of Coprinus are as yet only partially represented in the College herbarium. Duplicate specimens of many Manitoban fungi are in the herbaria of those mycologists who have assisted in the work of identification.

In the solution of the difficult problems of nomenclature which have arisen in preparing the manuscript of this volume for the press, the authors have aimed at a reasonable conservatism. Thus they have preferred names in current acceptation in the modern, although not necessarily the latest, mycological literature. Detailed descriptions are seldom given, except in respect to new species. Where a parasite is listed, the genus of the host is usually given without the species, but the specific name of every host plant is recorded in the Host Index of Parasitic Fungi. The names of the hosts and the range in spore size are given for most of the Fungi Imperfecti, and it is hoped that these data will enhance the usefulness of the book.

So far as a record of the regional distribution of fungi within the Province of Manitoba is concerned, these pages do no more than provide a modest beginning. The grounds of the Manitoba Agricultural College, together with the woods and fields immediately surrounding them, are meant wherever the contraction "M.A.C." is used. This relatively small region is frequently mentioned, not because it is particularly rich in species, but because it is conveniently situated and has therefore been most thoroughly explored; a fungus listed only at M.A.C. may doubtless be found in many other localities within the Province.

As a rule, the places in which a species has been collected have been recorded, for such data often serve to throw light on the nature of the plant association to which the species belongs and the climatic, topographical and soil conditions of the locality. In this connection the reader is referred to Section II and, more especially, to Section IV.

In groups of fungi that have a brief fruiting season, e.g. Agaricaceae and certain Pezizales, the dates of collection have usually been recorded. Annotation, of necessity, has been limited; and only important economic or critical remarks have been retained in the text. Complete records are preserved in the herbarium at the Manitoba Agricultural College.

II.

THE NATURAL FEATURES OF MANITOBA.

Manitoba, which mycologically is a region of considerable interest, lies between the 49th and 60th parallels of north latitude, its southern boundary extending from near 95° W. of Greenwich to beyond 101° and its northern boundary from 89° W. along the sea-coast of Hudson's Bay to 102° (Fig. 1). It is about half-way between the Atlantic and the Pacific, and southern Manitoba is approximately at the centre of North America. The map facing page 1 indicates its general geographic, phytographic, and physiographic features. It should be noted that all our collections have been made in the southern half of the Province between the 49th and 54th parallels, and most of them south of the 51st.

The area of Manitoba is 251,832 square miles, of which Lake Winnipeg occupies over 5,500 square miles and other lakes a total of 5,000 square miles or more. This vast territory contains a comparatively limited phanerogamic flora, owing to its high latitude, its cold winters, and the lack of greatly varied physiographic features. Its woods appear thin and stunted to the visitor from warmer and damper regions. The first impression of a botanist who looks at Manitoba's position on the map is likely to be that the Province contains but few fungi. Nevertheless, since in its southern half there have been found 1,108 species of Angiosperms, 12 of Gymnosperms, 42 of Pteridophytes, and about 90 of Bryophytes,[1] it is evident that there must also be many saprophytic fungi to destroy the annual accumulation of dead parts of these plants. Furthermore, the vascular plants provide hosts for many parasitic fungi, and it is of interest to discover which parasites occur near the limits of their host range. Since many species of phanerogams reach a portion of their northern, eastern, or western limits within the Province, many fungi must also reach their corresponding limits there. Nearly every record of a fungus from Manitoba extends the known range of the species, often for hundreds and sometimes for even thousands of miles.

The phanerogamic flora, one of the most important factors in the distribution of the fungi, consists in Manitoba of many of the north-temperate herbs and shrubs, together with a somewhat limited number of trees. Since many fungi have a necessary parasitic, mycorrhizal, or saprophytic relation with particular species of phanerogams, the absence of familiar names of fungi from the List of Species may frequently be explained by the absence of the proper host plants. It may be of value to record that the native trees with which fungi have been found associated are the following: balsam fir, black and white spruces, jack pine, larch, the willows, three species of poplar, birch, elm, scrub oak, box elder, basswood, ash, and several shrubby plants such as juniper, hawthorn, mountain ash, *Acer spicatum*, Amelanchier, Prunus spp. and Elaeagnus. The absence from Manitoba of beech, the larger oaks and maples, and numerous other trees, shrubs, and herbs of eastern and western Canada must limit materially the fungi to be found there.

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[1] Figures compiled by Professor V. W. Jackson.

Although the rocks exposed at the surface in eastern and northern Manitoba are of pre-Cambrian age, yet we have to recognize that the present flora in its entirety must have reached the Province in times geologically very recent. The green plants now inhabiting Manitoba have arrived since the Pleistocene ice-sheet melted and disappeared some 25,000 years ago, and the fungi must have accompanied or followed them. Most of the fungi have been collected on ground formerly covered by Lake Agassiz.

Manitoba ranges in elevation from sea-level at Hudson's Bay to something over 2,600 feet in the hills along the western boundary. The altitude records of our fungus collections may be approximated from the following readings : Norway House and Victoria Beach 700 ft., Winnipeg 750 ft., Lake of the Woods district 1,100 ft., Brandon 1,200 ft., and Duck Mountain about 2,600 ft. Collecting territories are described in Section IV ; most of them can be found on the accompanying map (Fig. 1). Minaki and Kenora are situated in the extreme west of Ontario about 30 miles east of Manitoba.

Precipitation in Manitoba is frequently too low to provide favourable conditions for the development of fungi ; its annual average ranges from 16 inches in the south-west to about 22 inches around Winnipeg and Lake Winnipeg. A considerable proportion of this precipitation may come as snow. The humidity of the atmosphere is very low in winter and, as a rule, low in the summer. Temperatures range from an occasional day at 90° or even 100° F. in the summer to from 20° to even 40° below zero in the winter. The annual average at Winnipeg is 38·8° F.

III.

GEOGRAPHICAL DISTRIBUTION.

1. The Fungi of Manitoba compared with those of Europe.—Fungi are peculiarly cosmopolitan plants. Many species found in Manitoba occur in Europe, as is indicated by the fact that the names of eminent pioneer European mycologists, such as Persoon, Fries, Fuckel, and Berkeley, frequently appear on the Manitoba lists. It should be noted, however, that many American species were sent across the Atlantic to be described and named by Fries and Berkeley. The majority of the American, including the Manitoban, species not known in Europe, carry the names of Schweinitz, Farlow, Peck, Ellis, Arthur, and other American mycologists. It is hardly necessary to say that these authors' names are not a part of the names of the species but are usually added as an important guide to the original description. They are often broadly suggestive of the region where the fungus was first observed.

Most of the Myxomycetes listed here are also European, as might be expected from our knowledge of the fact that, in general, the members of this group have a very wide distribution throughout the world. About 85 per cent. of the Phycomycetes are known in Europe; the remaining 15 per cent. are principally Peronosporales of non-European hosts. Approximately 70 per cent. of the Ascomycetes occur in

Europe: only about 55 per cent. of the Sphaeriales are found there, but some 90 per cent. of the Protodiscales, Helvellales, and Pezizales are Old World species. In the Basidiomycetes, fully 60 per cent. of the Agaricaceae were first collected in Britain and northwest Europe, and about 50 per cent. of the Uredinales include Europe within their range. Approximately half of the Fungi Imperfecti are known in Europe or, so far as the chief subdivisions are concerned, about 60 per cent. of the Hyphomycetes, 30 per cent. of the Melanconiales, and 50 per cent. of the Sphaeropsidales.

Of the 1,969 species of Fungi recorded for Manitoba, some 1,200, or about 60 per cent., are found also in Europe. This percentage is of the same order as that for the Pteridophyta, another group of plants disseminated by microscopic, wind-blown spores; but it greatly exceeds that for the Phanerogamia, which owe their dissemination to relatively heavy seeds. As may be seen from the accompanying statistical Table, 69 per cent. of the Pteridophyta of Manitoba occur also in Europe, but of the Phanerogamia only 29·7 per cent. (Pinaceae 16·7, Monocotyledones 36·9, Dicotyledones 27·6). In other words, 6 of every 10 species of Fungi, 7 of every 10 Pteridophyta, but only 3 of every 10 Phanerogamia, occur in Europe as well as in Manitoba.

The contrast between the percentage of Fungi and that of Phanerogamia common to Europe and Manitoba becomes even more noteworthy when we exclude from the statistics the introduced species. The Phanerogamia growing without cultivation in Manitoba are given in the last published list (20) as 939 species; but, of these, 86 species (mostly weeds) have been introduced directly or indirectly from Europe, while

9 species have been introduced into Europe from North America. If we exclude these introduced species, the percentage of Phanerogamia common to both Europe and Manitoba becomes reduced from 29·7 to 21·8. Certain species of fungi (mostly "fungus-weeds," parasites of cultivated plants) have also been introduced from Europe into Manitoba, but the percentage, although apparently small, cannot be determined with accuracy.

Pteridophyta and Phanerogamia of Manitoba and the Number of Species common to Europe and Manitoba.

	Pteridophyta	PHANEROGAMIA			Total Phanerogamia
		Pinaceae	Monocotyledones	Dicotyledones	
Native in both Europe and Manitoba .	29	2	69	113	184
Introduced from Europe to Manitoba . .	—	—	13	73	86
Introduced from North America to Europe	—	—	1	8	9
Total number of species common to Europe and Manitoba .	29	2	83	194	279
Total number of species recorded in Manitoba	42	12	225	702	939
Percentage of native plants found in Europe . . .	69·0	16·7	32·6	18·2	21·8
Percentage of native and introduced Manitoba species found in Europe . . .	69·0	16·7	36·9	27·6	29·7

In the world, as a whole, there are far more known species of Flowering Plants than known species of

Fungi. Nevertheless, in Manitoba there have been found about twice as many Fungi as Flowering Plants. This seems to be due to the fact that, in general, Fungi have a wider range than Flowering Plants. Great Britain resembles Manitoba in having more species of Fungi than of Flowering Plants,[1] and it would be interesting to know whether or not Fungi exceed the Flowering Plants in number in other areas of the world comparable with Manitoba and Great Britain.

2. The Fungi of Manitoba and of the United States.—The great majority of the fungi reported in this work have been found in the United States, and even the forty-five new species also probably occur there. It may eventually be found that some Manitoban fungi are more northern species which do not extend southward, but it is probable that any fungus recorded in Manitoba has a distribution which also covers some portion of the United States, since all the phanerogams with which the Manitoban fungi have been found associated occur in some areas of that great country. It is possible, however, that certain vascular plants restricted to northern areas, including parts of northern Manitoba, may be found to support species of fungi not occurring south of the international boundary. In addition, there are not a few fungi occurring chiefly or solely in their mature form in northern latitudes that carry on chiefly or solely by their quite unlike " imperfect " forms in southern or warmer latitudes where special developments for survival of the winter are not necessary.

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[1] The number of Phanerogamia and Pteridophyta given in the *London Catalogue of British Plants* (eleventh edition 1925) is 2,362. Rea in his *British Basidiomycetae* and his *Appendix* thereto (*Trans. Brit. Myc. Soc.*, XII, 1927) enumerates of Hymenomycetes and Gasteromycetes alone 2,613 species. This number would be more than doubled if to it were added all the other British Fungi included in the Uredinales, Ustilaginales, Phycomycetes, Ascomycetes, and Fungi Imperfecti.

3. The Fungi of Manitoba and of Southern Ontario.—The mild peninsula of Ontario extending southward between the Great Lakes has a flora including many plants not found elsewhere in Canada. Its phanerogamic and cryptogamic floras resemble those of New York and Michigan. A larger number of species of fungi have been found in the counties around London, Ontario, than have been found in Manitoba ; and a noticeable but not easily defined difference is evident between the conspicuous features of the fungus-floras of the two localities.

4. General Observations upon the Distribution of the Fungi.—It is evident that many species of fungi are widely distributed over the world, and that many others are limited in their distribution because they can utilize only certain hosts or substrata. Thus the species of Myxomycetes, Helvellales, and Pezizales, which develop upon substrata of old wood or humus and usually are not restricted to specific phanerogamic remains and which are found in Manitoba, are for the most part found also in Europe. The Agaricaceae occupy a somewhat intermediate position as regards distribution, because they frequently have a mycorrhizal or saprophytic relation to certain hosts. The Sphaeriales and Sphaeropsidales, and more particularly the parasitic groups such as the Uredinales and most of the known Melanconiales so far observed, are found to be more largely non-European because so many of their hosts are confined to North America.

Climatic factors, such as rainfall, humidity, temperature, and length of season, have an important effect upon the prevalence or destructiveness of fungi. Thus the dry climate of Manitoba is doubtless responsible for the absence from the Province in most years of such moisture-requiring Peronosporeae as *Phytophthora infestans* and *Pseudoperonospora Humuli*, and for the total absence of *Phytophthora Phaseoli* and *Peronospora Schleideni*. It is certain that some thousands of European and Asiatic fungi have not crossed the ocean barriers which separate them from North America. Nevertheless, since the distribution of fungi in general is surprisingly cosmopolitan, it is to be expected that sooner or later there will be found in Manitoba a considerable proportion of the fungi capable of developing upon the substrata present. The importance of the host-relation factor is well shown in Manitoba, as elsewhere, by the marked difference in the fungus-floras of two adjacent forests, one deciduous and the other coniferous.

Collections of plants, usually including some fungi, have been made by several of the exploratory expeditions sent to the Canadian arctic regions, but no specialist in mycology has ever collected there. One of us (J. D.) studied the fungus material brought back by the Canadian Arctic Expedition of 1913–1918 (17a). Part of the territory explored by the Expedition lies due north of Manitoba. Of the total of 142 species recorded for the Canadian arctics only 19 are named in both the Arctic list and that of Manitoba. The survey of the wide gap of nearly a thousand miles between the Arctic Circle and the portion of Manitoba over which we have collected will certainly yield interesting results.

IV.

THE FUNGI OF PARTICULAR AREAS.

1. Manitoba Agricultural College is situated on the banks of the Red River nearly four miles south of the limits of the city of Winnipeg. The soil is a heavy clay loam resulting from sediments which were deposited at the bottom of the glacial Lake Agassiz and were subsequently overlaid by deposits left by inundations of the Red River. The surface is flat and, in very recent times—perhaps within the past century—has become covered with a young deciduous forest, except for a few shallow depressions in which water remains during the spring and precludes the growth of trees. The trees are predominantly poplar ; but many ash, box-elder (*Acer Negundo*), oak, willow, and elm, and a few basswood (*Tilia americana*) are present and, here and there, they displace the poplars. An underbrush of various shrubs and herbs is able to develop beneath the trees over most of the area. The leaf-mould on the soil is thin, and there is an absence of large rotting logs such as lie on the ground in older and moister forests. The depressions or sloughs become filled with coarse grasses and sedges, Alisma, Sagittaria, etc., and the water dries up during the summer. The college plots are on land cleared from the woods. No conifers or birches occur in the native flora at M.A.C., nor are true prairie associations present. The collecting ground, therefore, is not an especially favourable one. Nearly all the M.A.C. fungi were collected within the south half of a circle having a half-mile radius and its centre at the Biology Building. This semicircle includes the varied cultivated plants of the college plots, the partially cleared college woods to the eastward, and similar woods just south of the college grounds. A few collections marked "M.A.C." were obtained on similar terrain but slightly outside the semicircle. Within this limited territory intensive surveys, made throughout the year with the assistance of the staff of the Rust Research Laboratory, have resulted in the discovery of about 1,200 species of fungi (summary in Section XI). The Sphaeriales, Thelephoraceae, and Fungi Imperfecti have been studied carefully nowhere else in the Province. Many Myxomycetes, Pezizales, and Polyporaceae have been found here; the Rust that has escaped collection must be very scarce. The Agaricaceae are not especially abundant or diverse around M.A.C. but, because they could be carefully studied, the total number of species recorded is relatively large. The environs of the Manitoba Agricultural College constitute an area mycologically well but not exhaustively explored.

2. **Victoria Beach** is a peninsula, formerly an island, extending into Lake Winnipeg 70 miles N.N.E. of Winnipeg. The soil varies from pure sand to a sandy loam. Coniferous trees predominate, particularly *Pinus Banksiana, Abies balsamea, Picea canadensis, P. mariana,* and Juniperus. Birches and other deciduous trees are also common. The plant associations are Pinus-Vaccinium on the sand, Abies-Picea with no underbrush, mixed coniferous and deciduous woods, and marsh plants. Victoria Beach is an excellent collecting ground, and it has been visited

more than twenty times. The abundant flora of agarics has occupied much of our attention, but the other Basidiomycetes, as well as the Myxomycetes and Discomycetes, have also been sought. Victoria Beach, which is easily reached by rail from the end of May until early September, is representative of much of eastern Manitoba.

3. **Norway House** has been described in another publication (25). It is a highly interesting area, similar in topography to Minaki and Kenora, but 300 miles farther north. During a visit made by one of us (G. R. B.) in 1923, the Agaricaceae were present in great profusion, but there were no facilities for determining them. Another visit was made of a week's duration, Aug. 22–29, 1928, with preparations to study them, but they were very scarce because the summer had been extremely dry. As a result of the two expeditions, about 160 species of fungi were collected, several of which have not been found elsewhere in the Province. It is here, so far as we know, that *Puccinia gigantea* reaches its most easterly station. Practically half the species of Puccinia found are short-cycled. An exhaustive survey of the fungus-flora of the district would yield many valuable data on the distribution of fungi. The opening up of northern Manitoba will provide further opportunities for examining the mycologically unknown areas north of the 54th parallel.

4. **Minaki** and **Kenora** are on northern bays of the very irregular Lake of the Woods. Here the pre-Cambrian rock is exposed, or lightly covered with soil. The plant associations are much the same as at Victoria Beach and are representative of eastern Manitoba. In late September or early October every

year since 1924, a week-end foray has been held at either Minaki or Kenora, during which from three to twelve persons have collected fungi and studied the species found. Many other visits to these places, especially Kenora, have been made in the late autumn by A. H. R. B. The Agaricaceae at both Minaki and Kenora are very abundant, but many other groups are represented in the collections. In the tabulated summary given in Section XI, " Lake of the Woods " includes Ingolf and Indian Bay as well as Minaki and Kenora. When the last two places are cited for the distribution of a fungus, it will be understood that it is almost always a collection made about the end of September, i.e. near the close of the collecting season. Ingolf collections were nearly all made in August by W. N. Denike. Indian Bay is in Manitoba on a more southern part of the Lake of the Woods. All of the collecting grounds on the Lake are beautiful and rich in material for the mycologist and, although Minaki and Kenora are situated in Ontario, there can be little doubt that every species found there has a range which extends into Manitoba.

5. Western Manitoba, particularly as regards its dry prairies such as those around Brandon, Carberry, and southward, offers an attractive field for the student of fungi. Professor W. P. Fraser has found many rusts there. The authors have had little opportunity to collect the other parasitic fungi occurring on these western prairies, but such excursions as have been made have been very productive.

V.

IMMIGRATION AND ECOLOGY.

1. Immigration.—It has been remarked already that the fungi in the region surveyed must all have arrived during the few thousand years which have elapsed since the glacial Period came to a close. Some of the species may have come in with their vascular hosts and others by spores transported by air-currents and other agencies. The fungus-flora is not static, for the immigration of new species is still in progress. As examples of fungi which have come into Manitoba apparently within the last decade may be mentioned : *Plasmopara viticola*, *Phytophthora infestans*, *Sphaerotheca mors-uvae*, *Urocystis Cepulae*, *Puccinia Sorghi*, *Puccinia Antirrhini*, *Puccinia anomala*, and *Uromyces Trifolii* (33). It is possible, of course, that certain of these species may have been present somewhat longer, or that some may have been re-introductions which were present at some previous time and, temporarily, had disappeared from the Province. Thus *Phytophthora infestans* may have occurred in preceding damp periods, but its prevalence in 1927 and 1928 was doubtless due to re-introduction.

All of the fungi just mentioned attack cultivated plants which have been grown in Manitoba for no more than a century and, for the most part, during a much shorter period. Man, through his transportation agencies, has brought in some of them ; and he will continue to introduce fungi, especially those parasitic upon economic plants. This survey will aid in the detection of future introductions.

Saprophytes and parasites of native plants are also undoubtedly still arriving in Manitoba. A number of Peronosporales which were first found in 1928 are indicated by this date in the List of Fungi; but one cannot be sure that they were not here earlier. Fungi not infrequently are found where they had not occurred in previous years. Thus *Boletus sphaerosporus* first appeared in 1926 and was rather common in 1927 in an area at the Manitoba Agricultural College which had been carefully examined in each of the preceding six years. It may have been a new arrival; but, more probably, it was an old inhabitant which found conditions propitious for fruiting in 1926 and 1927. It should be recorded that it was not found in 1928. Speculations regarding the time of arrival of fungi, excepting certain parasites of crop plants, may lead one far astray; for instances are known of the long persistence of mycelium whose fruitings have been separated by intervals of many years.

2. The Effect of the Manitoba Winter.—During the four or five winter months the temperature in Manitoba is below the freezing-point except for occasional days and, on the average, is below zero Fahrenheit for several weeks. Winter conditions, although they affect the growth and development of the fungi, do not seem to make any difference in the abundance of the fungi when the growing season returns.

Some of the Agaricaceae are not infrequently precluded from autumn development because of the early onset of winter, in which case they may appear during the following spring, e.g. *Cortinarius mucifluus* and

Psalliota campestris. On the other hand, the retardation induced by winter so checks many fungi that they do not appear until late in the summer. Spring, however, regularly brings its crop of such fungi as Morchellae, certain Pezizales, and the mature stage of many Pyrenomycetes. Because the Barberry is absent, the cycle of the wheat-rust, *Puccinia graminis* (except the race *P. graminis phlei-pratensis*), is broken with the death of the urediniospores during the winter. The annual recurrence of wheat-rust starts from spores borne by southern winds from the United States. This important statement has been proved by numerous experiments made in western Canada by W. P. Fraser who studied the loss of vitality of the urediniospores and by the staff at the Rust Research Laboratory who collected air-borne rust spores on slides exposed from aeroplanes and stationary objects. Other species of rusts and some other fungi may perhaps migrate in a similar manner. Uredinales that can carry on from season to season by their summer spores in warmer latitudes may survive the winter in Manitoba by producing well-protected teliospores. *Plasmopara viticola*, which attacked cultivated grapes seriously at Morden and M.A.C. in 1927, could not be found in 1928 and, evidently, it had been killed during the winter.

Doubtless the rigours of winter may account for the absence of certain fungi from Manitoba, or perhaps some of those found may have been merely transient visitors arriving now and then for a summer only; but obviously most Manitoban fungi do not find the winters fatal. Species of Fomes are perennial; others, such as *Polyporus betulinus* and *Collybia velutipes*, may develop as winter annuals. That the cold of winter cannot injure such a fungus as Schizophyllum is demonstrated by the experiments of one of us (A. H. R. B.), who subjected fruit-bodies to the temperature of liquid air for three weeks, and found them to be still viable (39). Such fungi are capable of surviving long periods of desiccation such as occur in winter. *Daedalea unicolor* in the dry condition kept its vitality in the dark at room temperatures for over eight years (49).

3. Fungi developing upon other Fungi in Manitoba.—Several species are actively parasitic upon fungi. Examples are Piptocephalus on Mucors, Ciccinobolus on Erysiphaceae, Darluca on Uredineae, Sphaeronemella on Helvella, Scolecotrichum on Clavariae, and *Hypomyces lactifluorum*, Peckiella, and Mycogone on various Agaricaceae, especially Lactarii and Russulae.

Other species are less actively parasitic, or only saprophytic, upon the fungi. Chaetocladium is sometimes parasitic upon Mucors. Sphaeriales, such as Diatrype, Hypoxylon, Massaria, and Valsa, may bear *Nectria episphaeria*, *Hypocrea patella*, and *Calonectria Dearnessii*. Polypori and Fomes may support *Badhamia utricularis*, *Hypomyces aurantius*, *H. rosellus*, *Hypocrea citrina*, *H. pallida*, *Melanospora lagenaria*, and *Eleutheromyces subulatus*. Agaricaceae and Boleti frequently become overgrown with *Sepedonium chrysospermum*, *Cladosporium epimyces*, Syzygites, Aspergillus, *Hypomyces rosellus*, and occasionally with Eleutheromyces.

Lichens in Manitoba are sometimes found upon old woody fungi; but, apparently, they have no specific relations with them except in the case of *Calicium polyporaeum* which frequently occurs on *Polyporus pargamenus* and other thin Polypori. Conversely, a number of fungi are known to be parasitic upon lichens, although only *Illosporium roseum* and a species of Sporotrichum have been observed upon them. The fungus parasites of the Algae, the Mosses, and the Hepatics have not yet been studied.

4. The Fungi attacking Insects and other Small Animals.—Some of the insects attacking crop plants may be held in check to a greater or lesser degree by parasitic fungi. *Entomophthora Grylli* kills grasshoppers, especially when the latter become abundant. House-flies become infected in autumn by *Empusa Muscae*, and aphids may be decimated by *Empusa Aphidis*. Cutworms are sometimes killed by *Entomophthora virescens* or *Tarichium megaspermum*. White grubs are occasionally affected with *Cordyceps militaris*, and *C. clavulata* has been seen on Lecania. Young chickens are sometimes killed by *Aspergillus fumigatus*.

VI.

COPROPHILOUS FUNGI.

A characteristic and highly interesting fungus-flora, as is well known, develops upon the dung of animals. The mechanisms by which many of these organisms produce and liberate their spores in such a way as to perpetuate the species on their peculiar substratum have been carefully studied by one of us, and many of his observations have been, or will be, recorded in the volumes of his *Researches on Fungi* (35). Coprophilous fungi, doubtless, have a very wide distribution. Ninety-three species of them have been collected in Manitoba.

Of those Myxomycetes which are known to be fimicolous, at least facultatively, several are present in Manitoba. *Didymium difforme* has been found only upon horse dung. *D. vaccinum* has been found but once, on cow dung. *D. squamulosum* and *Craterium leucocephalum* sometimes occur upon horse dung, and *Licea fimicola* is known only on this substratum. Several Myxobacteriaceae are coprophilous, but the only one identified is *Chondromyces crocatus* which is common on wet horse dung or upon the decaying stipes of small Coprini, often in such abundance as to give the substrata a sprinkled, crocus-yellow colour. *Dictyostelium murcoroides*, of the Acrasieae, is not uncommon on horse dung. No effort has been made to determine the numerous bacteria occurring upon dung.

In the Mucorales ten fimicolous species have been identified, including a Piptocephalus which is frequently a parasite on *Mucor mucedo*, etc. A species of Syncephalis sometimes parasitizes Pilobolus. Several genera of Ascomycetes are commonly or entirely inhabitants of dung. Two species of Ascobolus, three of Ascophanus, *Lasiobolus equinus*, two species of Patella, *Peziza vesiculosa*, *Pyronema canina*, three species of Rhyparobius, and *Saccobolus depauperatus* are listed as coprophilous Pezizales and *Gymnoascus Reessii* as a coprophilous species of Aspergillales. The Chaetomiaceae and Sordariaceae, of which twenty-five species have been found, are predominantly fimicolous. No other member of the Sphaeriales has been observed upon dung in Manitoba.

The coprophilous Basidiomycetes given in the List of Species are all Agaricaceae, excepting *Cyathus stercoreus* and *Sphaerobolus stellatus*, and they include : two species of Bolbitius, one each of Galera, Pluteolus, Psilocybe, and Anellaria, three of Stropharia, seventeen of Coprinus, three of Panaeolus, and sometimes *Psalliota campestris*. None of these has white or pink spores. Among the numerous coprophilous Fungi Imperfecti the only identifications are : one species each of Aspergillus, Botrytis, Coremium, and Graphium.

When fresh dung has been brought into the laboratory and placed in a damp-chamber, a succession of fungi always appears upon it, and this succession is influenced by the kind of dung, the moisture, and the temperature. The task of identifying the fungi is simplified as one becomes familiar with their time of occurrence. Many observations have been made at Winnipeg on the succession of fungi upon horse dung. Usually the dung was collected in the winter in a frozen condition, i.e. under conditions which practically precluded its extraneous inoculation by spores or mycelium. When such material was placed under a bell-jar in diffuse light at room temperature, and moistened only when the danger of drying became imminent, the succession of fungi was as follows :

First and second day, certain bacteria but no obvious development of fungi. On the third day, Pilobolus, usually *P. longipes,* generally appeared in profusion. From about the fourth to the seventh day a profuse white overgrowth of *Mucor racemosus* and *M. Mucedo* appeared, sometimes so soon as to overwhelm many of the Piloboli. The Mucors at once proceeded to develop sporangia, their mycelium then became attacked by Piptocephalis and Chaetocladium, and the cycle was completed with their inconspicuous remains left upon the substratum. About the ninth day *Fimetaria fimicola*—the first Pyrenomycete—appeared, and it was usually abundant for several days. At this time certain Mucorales, such as Syncephalis, *Pilobolus crystallinus*, and *P. Kleinii* were observed. On the tenth day, usually, *Coprinus curtus*—the first agaric—began to push up its fruit-bodies.

During the second fortnight *Coprinus lagopus* and *C. ephemerus* are almost certain to be present as early followers of *C. curtus.* Simultaneously, *Lasiobolus equinus* appears and *Ascobolus immersus* becomes mature. *Ascobolus stercorarius* and Ascophani may develop during this period or later and, usually in damp parts, *Chondromyces crocatus* and other Myxobacteriaceae. *Pleurage decipiens* often matures about the sixteenth day, and thereafter a number of other species of Pleurage are likely to be present for weeks or months. *Pleurage anserina*, *P. taenioides*, and *P. minima* have been observed along with *Sporormia minima* about the eighteenth day. *Sporormia intermedia* and *Panaeolus campanulatus* are frequently found before the end of a month. *Phycomyces blakesleeanus* rarely develops.

After a month, certain fungi appear for the first time. *Coprinus sterquilinus* may now develop ; if it does, it so covers the substratum with mycelium as to swamp other fungi. If it does not appear there may come up in its place species of Didymium, Saccobolus, and Graphium, *Pleurage albicans*, *P. conica*, and other species of Pleurage whose time-factor has not been critically observed. *Delitschia insignis* has been found only after the culture had become several weeks old. *Peziza vesiculosa*, *Coprinus Hendersonii*, *C. longipes*, and *Galera bulbifera* appear only in old cultures. *Anellaria separata*, *Panaeolus solidipes*, and *Stropharia semiglobata* have occasionally been observed.

Psalliota campestris, *Cyathus stercoreus*, and *Sphaerobolus stellatus* have not been seen in these cultures kept from the beginning in the laboratory.

If the horse dung be kept wet, sclerotia of *Coprinus stercorarius* usually develop at its surface after about three weeks, and, if left undisturbed upon the dung, they may, without having dried up, produce fruit-bodies a few weeks later. *C. narcoticus* also appears on the wet substratum, but rarely : it has been seen only three times. Myxobacteria and bacteria are more abundant, but many of the fungi which appear on dryer dung now fail to develop.

Dung of cow, goat, rabbit, etc., show successions of fungi differing in many respects from that on horse dung, but the data for such successions are at present incomplete and will not be recorded here. It should be mentioned that the animal referred to as " rabbit " in Manitoba is really the Varying Hare, *Lepus americanus phaeonotus*.

VII.

NEW SPECIES.

The following species are described as new in this publication, the authors being Dearness and Bisby unless otherwise stated :

Licea fimicola
Pyronema canina
Stictis curtispora
Dichaena Populi
Graphyllium manitobiense
Halbaniella Linnaeae Dearn.
Curreyella Bisbyi Dearn.
Ceriospora manitobiensis
Didymella manitobiensis
Leptosphaeria rugosa
Metasphaeria querna
Pyrenophora rugosa
Diaporthe Viburni
Diatrype Celastri
Sporobolomyces albus Hanna
Hypochnus flavo-brunneus
Hypholoma longipes
Coprinus longipes Buller
—— **parvisporus** Buller
—— **stellatus** Buller
Cercoseptoria Lappulae
Cercosporella Gei
—— **Nesliae**

Ramularia coccinea
—— **sepium**
Scopularia Populi
Trichosporium parasiticum
Colletotrichum Humuli Dearn.
Gloeosporium spadiceum
Marssonia Aquilegiae Dearn.
Heteropatella Viburni
Phyllosticta Corni-canadensis
Rhabdospora Viburni-Opuli
Septoria Giliae

Two new varieties are also included here : *Gnomoniella Coryli* var. **circinata,** and *Pleurotus atrocaeruleus* var. **minimus.**

From the collections we have made in Manitoba, the following species have previously been described as new :

Didymosphaeria manitobiensis E. & E.
Corticium septentrionale Burt
Peniophora odontioides Burt
Ptychogaster subiculoides Lloyd
Cerospora manitobana Davis
Phyllosticta Dracocephali Dearn. & Bisby
Cylindrosporium sibiricum Dearn. & Bisby
Marssonia Sonchi Dearn. & Bisby
Septoria Sonchi-arvensis Dearn. & Bisby
Stagonospora Amorphae Dearn. & Bisby
Septogloeum rhopaloideum Dearn. & Bisby

The 45 new species and 2 new varieties found in collecting about 1,950 species indicate that the fungi of North America are still imperfectly known, rather than that the mycological flora of Manitoba is peculiar.

VIII.

RARE SPECIES.

Although the new species listed in Section VII might be supposed the rarest, they are not always so; for some of them are common in Manitoba and probably elsewhere, and their existence hitherto had merely escaped notice. A number of species usually considered rare in other parts of North America are fairly abundant in Manitoba. "It seems to me," wrote Dr. F. J. Seaver, Aug. 2, 1928, "that a great many interesting species are collected up there which are not frequently found in other places . . . it may be because the collecting is more intensive." No doubt careful surveying counts for much, but environmental factors seem to be needed in any attempt to explain why such species as *Polyporus ovinus*, *Clavaria Patouillardii*, *Claudopus mephiticus*, *Crepidotus cinnabarinus*, *Helvella sphaerospora*, *Ascobolus striisporus*, *Plectania hiemalis* (*Sarcoscypha protracta*), and *Polyporus tuberaster*, rare or unknown in many areas in North America, are more or less common in Manitoba. On the other hand, many species common in more southern or eastern parts of North America are, for no obvious reason, rare in the Province, e.g. *Polyporus sulphureus*, *Urocystis Cepulae*, *Puccinia anomala*, *Gibberella Saubinetii*, *Diplodia Zeae*. Some species, such as *Physarum rubiginosum*, *Pseudoperonospora Humuli*, *Underwoodia columnaris*, *Polyporus albiceps*, *Pleurotus subpalmatus*, *Cortinarius vio-*

laceus are not only rare in Manitoba but rare throughout North America.

A few European species not previously known in North America are here recorded apparently for the first time, e.g. *Delitschia insignis*, *Entyloma Achilleae*, *Coprinus Rostrupianus*, *Hygrophorus nigrescens*, and *Harposporium Anguillulae*.

Certain fungi may be considered rare that are readily found when their habitat is known. Thus the sclerotium-producing *Coprinus Rostrupianus*, previously recorded with certainty only by Hansen in Denmark, has been easily found in old cow-dung plats in Manitoba every year since 1923 when the authors first discovered it there.

In closing this Section, it may be of interest to mention that *Fomes fomentarius*, which has a European range but appears to be absent from England [1] and is very rare in the north of Scotland, is one of the commonest polypores in Manitoba where it causes the destruction of a great many birches (*Betula papyrifera*).

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[1] Miss E. M. Wakefield of the Kew Herbarium has informed the writers that the statement made in British fungus-floras, namely, that *Fomes fomentarius* is common in England, is based on a misinterpretation of the species which was due to a misleading citation by Fries.

IX.

FUNGI APPARENTLY ABSENT.

Many fungi are absent because their hosts do not grow in Manitoba ; others, common in Europe, have not reached North America ; but for the absence of still others no explanation is apparent. *Scleroderma aurantium* (*S. vulgare*), not yet found in the Province, is said by Coker and Couch (11) to be northern in range in North America and to grow in either deciduous or coniferous woods. *Plectania coccinea*, whose bright red cups are conspicuous in the spring in Minnesota, is inexplicably absent from the observed range. *Puccinia suaveolens* has not been found, despite much search, although it occurs in the adjoining States of the U.S.A. and its host is a common weed. *Puccinia glumarum*, which is common in western North America, has never yet invaded the wheat-fields of Manitoba. There is no Manitoban record of *Collybia radicata* which is common in eastern Ontario, nor of the showy and edible *Amanita caesarea* and *A. rubescens*. *Fistulina hepatica*, so well known in Europe and parts of North America, has never been found on *Quercus macrocarpa* (the only oak in Manitoba) or on any other tree.

The absence from Manitoba of certain fungi, e.g. *Collybia fusipes*, whose clustered fruit-bodies are so often seen over the roots of beeches and oaks in Europe, and of *Coprinus picaceus*, one of the most striking of the European Coprini, is not surprising, since such experienced mycologists as Atkinson, Kauffman, and Murrill have never found these species in North America.

Doubtless a more complete knowledge of the relation of various fungi to the phanerogams with which they are associated would help to explain why the authors have not found some of the fungi for which they have sought.

X.

ESTIMATES OF THE TOTAL NUMBER OF SPECIES OF FUNGI IN MANITOBA.

Including 64 species of micro-fungi as yet not satisfactorily determined, over 2,000 species have been collected in the area surveyed. The fungus-flora of Manitoba may be compared with that of north-central Europe which, mycologically, is thoroughly known. In the nine volumes of Rabenhorst's *Krypto-gamen-Flora* which treat of north-central Europe nearly 15,000 species of fungi are described, of which about 8,400 are Imperfecti and, therefore, in a good many instances merely stages of mature forms described under other names. On the other hand, this territory has yielded and is still yielding many additional species since Rabenhorst published his work, and a total of 15,000 actual species may yet be found within its boundaries. Manitoba has less diversity of soil and situation, fewer indigenous and introduced phanerogams to serve as hosts, less rainfall, and colder winters than the corresponding region in north-central Europe, all of these factors tending to reduce the number and variety of its fungi. Yet it seems conservative to estimate the number of fungi in Manitoba at one-half that of north-central Europe, i.e. very roughly at about 7,500.

Our collecting records show 540 species at the close of 1922; additions: during 1923, 150 species; 1924, 160 species; 1925, 240 species; 1926, 240 species; 1927, 290 species; 1928, 367 species. The ascending curve of numbers is due to increased experience in collecting, wider knowledge of the territory, and more workers; but, notwithstanding these advantages, it could not continue rising with increased rapidity unless a vast number of species still remained undiscovered.

Comparison between the fungus-flora of Manitoba and that of North Dakota (an adjoining State of the U.S.A.) may be made with the help of data published by Dr. J. F. Brenckle in *Mycologia* (Vol. IX, p. 275, and Vol. X, p. 199). He gives, as a " random sample " of the North Dakotan Ascomycetes, 267 species; while a similar " random sample," taken in Manitoba and including species collected up to the spring of 1926, was 238 species, of which only 75 were common to both lists. Assuming that the fungus-floras of Manitoba and of North Dakota are identical, a simple biometrical calculation indicates that the total number of Ascomycetes present in the two areas combined is $\frac{267 \times 238}{75}$ or, roughly, 850. But, if all the Ascomycetes of Manitoba, i.e. 415, be compared with the 267 in the " random sample " from North Dakota, only about 100 are common, in which case the total number of Ascomycetes in the two areas combined is, by calculation, about 1,100. These figures, although highly speculative, point to the conclusion that the number of species of fungi in Manitoba must be far greater, and probably more than double, the recorded number.

XI.

STATISTICAL SUMMARY.

Summary of the Total Number of Species and Varieties recorded, and the Number found in Certain Areas discussed in Section IV.

Group	M.A.C.	Victoria Beach	Norway House	Lake of the Woods	Total in Manitoba
Myxomycetes . .	55	24	3	9	79
Bacteria . . .	17	0	2	0	23
Phycomycetes :					
Oomyces . .	20	2	1	2	30
Zygomycetes . .	14	2	1	0	18
Ascomycetes :					
Lower orders . .	3	1	0	0	4
Helvellales . .	8	12	1	11	18
Pezizales . .	76	33	5	25	111
Phacidiales . .	11	3	2	4	16
Hysteriales . .	5	6	4	2	12
Tuberales . .	0	0	0	0	1
Aspergillales . .	1	0	0	1	4
Perisporiales . .	19	11	4	9	24
Hypocreales . .	18	8	3	7	24
Dothidiales . .	4	2	1	1	6
Sphaeriales . .	170	13	8	12	194
Laboulbeniales .	0	0	0	0	1
Basidiomycetes :					
Sporobolomyces .	2	0	0	0	2
Ustilaginales . .	22	4	4	3	36
Uredinales . .	55	24	28	23	134
Other lower orders .	11	6	4	10	20
Thelephoraceae .	55	12	17	17	81
Clavariaceae . .	11	7	4	10	23

Group	M.A.C.	Victoria Beach	Norway House	Lake of the Woods	Total in Manitoba
Basidiomycetes—*cont.*					
Hydnaceae . .	12	8	4	12	32
Polyporaceae .	62	36	19	38	98
Boletaceae . .	4	6	1	10	14
Agaricaceae . .	250	229	19	182	492
Remaining orders .	19	7	4	14	37
Fungi Imperfecti :					
Hyphomycetes .	113	10	12	15	173
Melanconiales .	20	3	3	4	49
Sphaeropsidales .	150	11	6	17	213
Totals . . .	1,207	480	160	438	1,969
Fungi parasitic on man, etc. (*vide* end of Section XIV)					20
Lichens (*vide* Section XV)					90
Grand total					2,079

From the Table it may be seen that the total number of species in each of the main groups is as follows: Myxomycetes, 79; Bacteria, 23; Phycomycetes, 48; Ascomycetes, 415; Basidiomycetes, 969; Fungi Imperfecti, 435; Fungi parasitic on man, 20; and Lichens, 90; making a grand total of 2,079. If from this grand total there be subtracted the varieties of species and a few entries of Ascomycetes duplicated in the list of Fungi Imperfecti, there remains a total of about 2,000 definite species found in Manitoba.

XII.

HISTORY OF OBSERVATIONS ON THE FUNGI OF MANITOBA.

During the nineteenth century, prior to its last decade, several naturalists including the late Dr. John Macoun visited Manitoba; but, so far as is known, none of them paid any attention to the fungi there. However, Macoun collected lichens, and his records published in his *Catalogue of Canadian Plants* have been combined with our own in Section XV.

The first observations on the fungi of Manitoba were made by one of us (J. D.) who visited the Province in 1891. He then saw *Puccinia graminis*, the destructive cereal rust,[1] and in late September and early October, along the Little Saskatchewan River (now the Minnedosa River), he collected rusts of sedges and wild roses as well as many specimens of *Didymosphaeria manitobiensis*. The Didymosphaeria was a new species which was named by Ellis and Everhart (7) and distributed by them in their *Exsiccati of North American Fungi* as No. 2761. Ellis and Everhart's description of this species appears to be the earliest printed record of a Manitoban fungus. Of two other fungi collected by the same author in 1891, namely, *Trametes carnea* and *Phragmidium Potentillae*, portions are now in the Manitoba Agricultural College herbarium.

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[1] Another of the authors (A. H. R. B.) found *Puccinia graminis* abundantly present on wheat in 1904, at which time the Winnipeg Grain Exchange began to take notice of its ravages. It is only since 1915 that the serious losses which it causes to the wheat-growing industry have been generally recognized.

A. H. R. Buller came to Manitoba in 1904, and he has studied the fungi every autumn and winter since that time. His publications are listed in the Bibliography. The three Criddle brothers have long been interested in the natural history of the area about Treesbank. Mr. Norman Criddle as early as 1906 (52) published some observations on the eating of *Amanita muscaria* by cattle, and he has made a number of excellent coloured drawings of the larger fungi, which will be valuable in subsequent studies of the mycology of the Treesbank district. Mr. Evelyn Criddle, during the past few years, has collected the rusts there, and his findings include certain species which no one else has collected in Manitoba. Mr. Stuart Criddle sent to the authors a number of fungi stored by squirrels in their nests (41), and he has grown *Polyporus tuberaster* from its sclerotium.

Mr. W. N. Cheesman (51), in company with A. H. R. B., collected several fungi in Manitoba in 1909. Professor V. W. Jackson, who has been at the Agricultural College since 1913, has rendered valuable assistance, especially in the determination of hosts, and, with J. F. Higham and H. Groh, has made a list of the flowering plants and ferns of Manitoba (20). Professor W. P. Fraser spent the years 1917 and 1918 at Brandon, where he collected and cultured a number of Manitoban rusts. Since that time he has continued his studies upon the rusts of the Prairie Provinces at the University of Saskatchewan (54–57).

Mr. I. L. Conners and G. R. Bisby arrived at Winnipeg in 1920 and since that time have studied the fungi as opportunity offered. Mr. Conners worked at Brandon during 1923 and 1924. Dr. D. L. Bailey came to M.A.C. in 1923 to direct the work of the Dominion Rust Research Laboratory. The staff of this institution now includes Mr. J. H. Craigie in charge, Dr. Margaret Newton, Messrs. Goulden, Hanna, Gordon, Conners, Johnson, Welch, Neatby, Greaney, Popp, Brown, and Petersun, each of whom has made useful contributions to our knowledge of Manitoban fungi, more especially those causing cereal diseases. The publications of the mycological workers in Manitoba are all included in the Bibliography.

XIII.

THE GROUPS OF FUNGI AND ACKNOWLEDGMENTS FOR ASSISTANCE IN DETERMINING SPECIES.

To avoid interpolations in the next Section, some observations on the classes, orders, families, or genera of the fungi included in the list of species will now be made.

The Myxomycetes (Mycetozoa) are moderately abundant in Manitoba, in spite of the apparently unfavourable environment. Dr. W. T. Elliott of England has critically examined material of most of the species. Lack of space prevented the inclusion of his many valuable notes which are filed with the specimens to which they respectively relate. Miss Gulielma Lister kindly examined several collections. Among the species found are a number that are rare and one that is new and here described for the first time.

On account of their peculiar life-history and remarkable variety and beauty of form, the Myxomycetes for the biologist and microscopist are a very attractive group and, on this account, they have received the attention of a number of Canadian workers. Among the Canadian lists of species are the following: Moore's for Pictou, Nova Scotia; Eastham's for Ottawa; Dearness' for Middlesex (17); Adamstone's for Lake Nipigon (15); Cheesman's for the Canadian Rockies (51); and Currie's for Ontario, the longest list of all (16).

The following Manitoban species of Myxomycetes were not included by Miss Currie in the 107 species and 10 varieties which she listed as present in Ontario :

Arcyria insignis
A. occidentalis
A. incarnata var. fulgens
Badhamia decipiens
B. panicea
Diderma radiatum
Didymium difforme
D. vaccinum
Fuligo septica candida
Lamproderma columbinum
L. scintillans
Oligonema nitens
Perichaena depressa
Physarella oblonga
Physarum connatum
P. didermoides
P. leucophaeum
P. maydis
P. mutabile
P. nutans robustum
P. rubiginosum
P. viride incanum
Stemonitis hyperopta
Trichia subfusca
T. contorta inconspicua
Tubifera casparyi
Licea fimicola.

Of the 22 species and 5 varieties just listed 16 species and all the varieties at present are only known in Canada from Manitoba. Other Canadian species not found by Miss Currie or the authors are : *Licea variabilis* reported from Ontario and Nova Scotia ; *Margarita metallica* and recently *Enerthenema Berkeleyanum* (18) from Nova Scotia ; and *Licea biforis* and *Lachnobolus ? congestus* from Ontario. Thus the total number of Myxomycetes recorded for Canada is 134 species and 15 varieties.

Lake Nipigon is in Ontario, not far from Manitoba's eastern boundary. Of the 29 forms found in the Lake Nipigon district (15) 6 have not yet been seen in Manitoba. Doubtless, when the whole Province of Manitoba has been adequately surveyed, the total number of Myxomycetes found within its borders, which is now 79, will be considerably augmented.

So far the authors have identified only one species in each of the following three groups: Myxobacteriaceae, Acrasieae, and Plasmodiophoraceae. No member of the Plasmodiophoraceae has yet been found parasitic upon any crop-plant in Manitoba.

In the list of bacteria parasitic upon economic plants the nomenclature used by Stevens has been followed (4). The bacterial diseases of native plants have not yet been studied. The most serious bacterial diseases of plants in Manitoba are those of the cereals, the fire blight of apples, bean blight, black-leg of potatoes, and soft rots of vegetables.

The Phycomycetes are not abundant in Manitoba, presumably because the climate is too dry. During wet seasons, however, and especially when two or more such seasons follow in succession, they develop to a moderate extent. Bisby and Conners (33) have recorded certain Peronosporeae which were found for the first time in the wet season of 1927. During 1928, another wet season, these downy mildews and some others were even more prevalent. Species found only in 1928 are so indicated in the list. Except the fungus which causes late blight of potatoes, which was injurious in 1928, none of the Phycomycetes has been found to cause much damage to crops. There are many Saprolegniales in the numerous lakes and streams of Manitoba, but they have not yet been critically examined. The commoner Zygomycetes are present and occupy their usual substrata. Some of the Entomophthorales are economically important because they attack injurious insects such as flies, grasshoppers, and cutworms.

The Ascomycetes, in Manitoba as elsewhere, are abundant. The authors have had the help of Dr. F. J. Seaver of New York with a number of Discomycetes, and of Dr. J. F. Brenckle of Northville, South Dakota, with a few of the Pyrenomycetes; but one of the authors (J. D.) has done the greater part of the work of identifying the species.

No attempt has been made to work out the Saccharomycetales. Two species of Sporobolomyces were collected at Winnipeg by Dr. W. F. Hanna. Since their mode of spore-discharge indicates that they belong to the Basidiomycetes, we have placed them there. The forthcoming Volume V of *Researches on Fungi* by A. H. R. Buller will present the arguments for this decision. Species of Sporobolomyces are doubtless common.

Few Protomycetales or Protodiscales appear to be indigenous in Manitoba. The Discomycetes, however, are well represented and include a number of rare or noteworthy species. The Phacidiales make a fairly good showing in the list, but the Hysteriales, although carefully sought, have proved to be rather scarce. In spite of much search, *Tuber separans*, identified by Dr. Helen Gilkey, was the only member of the Tuberales discovered. The Perisporiales are represented by most of the powdery mildews for which suitable hosts are present in the Province. A number of interesting Hypocreales also occur, but only a few Dothidiales.

The Sphaeriales constitute a very large and attractive order, although many of its genera and species are obscure and difficult to determine. Some of the species are parasitic throughout their life-history, while many others are severely parasitic in their youthful stage or stages but merely saprophytic in their mature stage. In relatively few cases has the connection between these stages been determined; but, where it is known, it has been recorded in the lists of the Fungi Imperfecti. The number of species of Sphaeriales is so large that they have been arranged in families.

The insects of Manitoba are only now being scrutinized for Laboulbeniales; and, up to the present, of these fungi, whose peculiar forms have been so beautifully illustrated by Dr. Thaxter, only one species has been found.

The Basidiomycetes are abundantly represented in Manitoba. Sporobolomyces, as already intimated, includes reduced forms, and it occupies a position corresponding to that of the Saccharomycetales among the Ascomycetes. The Ustilaginales are represented by most of the important smuts of cereals and by certain less common smuts of wild hosts. Professor H. S. Jackson, now of the University of Toronto, has verified a few of them as well as some of the rusts.

The list of Manitoban Uredinales is fairly complete. In this group the authors are much indebted to Professor W. P. Fraser, I. L. Conners, W. L. Gordon, and others named elsewhere. Professor Fraser examined several of the collections and, in some instances, supplied the entire record. Dr. J. C. Arthur of Purdue University also assisted in some of the determinations. Mr. Evelyn Criddle of Treesbank, during the past five or six years, has made a number of interesting collections which he has submitted to Professor Fraser. In 1925 Messrs. Fraser and Conners published a useful paper on the rusts of the Prairie Provinces which should be consulted for data on the distribution of the group

(57). Several species not then recorded for Manitoba will be found in the list of Uredinales given in Section XIV. The Host Index gives the complete list of species upon which rusts have been found in the Province. The familiar generic names Puccinia and Uromyces have been retained; otherwise, the nomenclature of the *North American Flora* has been followed.

The Thelephoraceae are well represented. The determination of the species is difficult, and for assistance the authors are indebted to Miss E. M. Wakefield of Kew and particularly to Dr. E. A. Burt (13) who has cited a number of our species in his monograph of the family.

Twenty-three species of the Clavariaceae have been listed; and in determining several of them Dr. W. C. Coker has given his aid. He and Dr. Beardslee, as well as Dr. Burt and the late C. G. Lloyd, have been consulted in respect to the identity of some of the Hydnaceae.

The list of pileate Polyporaceae may be considered to be fairly complete. The determination or verification of the great majority of the names is due to Dr. L. O. Overholts; and several species were identified by Dr. J. R. Weir.

The Boletaceae are better represented in wooded areas in Manitoba than the list indicates. Their soft tissues spoil so rapidly that it is difficult to keep them until a satisfactory determination can be made.

In the Agaricaceae, great numbers of individuals as well as species annually appear, particularly in eastern Manitoba and near the shores of Lake Winnipeg. Since the time of Fries it has been known that northern coniferous areas are particularly favourable for the development of these fungi, and Manitoba is no exception to the rule. The prevalence of agarics may vary markedly from year to year: for example, they were exceedingly abundant at Norway House in 1923 but, because of the dry summer in that region, very scarce during the corresponding season in 1928. Sometimes a cool wet autumn followed by an early winter prevents the development of certain species in the autumn, and then these species may appear in the following spring. The Winnipeg daily press commented several times in May and June, 1927, upon the early spring crop of "mushrooms." The drier prairies and deciduous woods of western Manitoba and the more promising conifer-covered hills in the west have not yet been surveyed.

The great majority of the Agaricaceae, like the Boleti, are subject to early infestation and destruction by insects, and in warm weather the undried tissues soon putrefy. Dried agarics are difficult to determine with certainty, for which reason the authors resident in Manitoba have had to make practically all of the determinations. One of them, A. H. R. Buller, has critically studied the mushrooms of the Winnipeg region for many years—indeed every season since 1904—and has found many of them identical with species that he knew in England and Germany. Some specimens have been submitted to Dr. C. H. Kauffman for his valued opinion, and his publications on this large group, dealing as they do with the agarics of almost adjacent territory, have been particularly helpful (8). Liberal use has been made of Güssow and Odell's finely illustrated book recently published at Ottawa (5). Uncertainty of determination is indicated in the list with an "(n)" and, as dried specimens are preserved in the college herbarium, corrections or confirmations of their names may yet be made.

The Amanitae, except *Amanita muscaria*, are not abundant in Manitoba, and some of the species are represented only by a few plants collected in a single locality. *Amanita muscaria* is common in open woods in August and September. Its potency as an intoxicant in small doses, and therefore as a poison in larger quantities, has been demonstrated by personal experiment on two occasions. Few records of death from mushroom poisoning in Manitoba have been found, but the Winnipeg evening papers of Aug. 5, 1921, contained a report of seven such deaths on an isolated farm not far from Dominion City. From the description of the case in the press we are led to suspect that the poisoning was due to *A. phalloides*, although no mycologist investigated the case. The newspaper account records that the " mushrooms " were gathered by the children on Sunday, and were cooked and eaten that day. On Monday one child died and apparently the other members of the family were too ill to call a physician. Another child died on Tuesday, the mother and another child on Wednesday, and two more children on Thursday, by which time neighbours arrived on the scene ; but the father, the last to succumb, could not be saved, and he was barely able to tell the story. Although *A. muscaria* is by far the commonest Amanita in Manitoba, it would seem that a more toxic species must have been eaten.

Extended discussion of most of the other genera of the Agaricaceae is unnecessary. It will be noted by the mycologist who studies the List of Species that many species common elsewhere have not yet been seen in Manitoba. Their omission may be due to insufficient study of the flora. It will also be noted that some species, e.g. *Collybia hygrophoroides* and *Claudopus mephiticus* are recorded as common, although they are rare or unknown in other areas of North America. The Cortinarii, as might be expected, are abundant, and many species of Inocybe are present. Critical observations on the Coprini, which have been long studied by one of us (A. H. R. B.), are supplied.

In Manitoba, Phallales, except *Dictyophora Ravenelii* which is usually found on old waste from lumber mills, are rare. A diligent search for Hymenogastrales has been rewarded by the finding of only two species, specimens of which were submitted to Dr. S. M. Zeller. The Lycoperdales are fairly common, and most of them have been named or verified by the late C. G. Lloyd. Of the Nidulariales, which are cosmopolitan, five species have been found, and of the Sclerodermatales three species.

The Fungi Imperfecti of Manitoba are represented in the List by many parasitic forms, as well as by a number of lignicolous and caulicolous saprophytes. The Melanconiales have not been found to be especially numerous, but the Hyphomycetes and Sphaeropsidales are very abundant. Future students will find much work to do in extending our knowledge of these groups. Relatively few of the species have been traced to their "perfect" form. For help with several of the parasites our thanks are due to Dr. J. J. Davis of Madison, Wisconsin.

For contributing the list of fungi observed on man and higher animals, which is placed at the end of the next Section, the authors are indebted to Dr. A. M. Davidson of the Winnipeg General Hospital.

XIV.

LIST OF SPECIES.

In the List abbreviations are used for authors' names, months of the year, and certain geographic regions. M.A.C. is used for the Manitoba Agricultural College area described in the Introduction. The (n) before a name implies a measure of doubt in the determination and usually means that the specimen referred to is *probably* the species or genus named or *near* it. Measurements, usually in the metric system, accompanying records are based on the material studied; microscopic magnitudes, unless otherwise stated, are given in thousandths of a millimetre—microns—usually with the sign omitted. As a rule, only generic names of hosts are recorded in this Section; the full binomial will be found in the Host Indexes. Where only the conidial stage of an "imperfect" fungus has been collected, it is listed in its place in the Imperfecti, usually with a reference to the perfect stage when the latter is known.

At the end of each description of a new species described by Dearness and Bisby will be found two numbers, e.g. for *Pyronema canina* : *4082* (D. *6719*). The former is the number of the co-type specimen in the herbarium at M.A.C., while the latter is the number of the type specimen in the herbarium of John Dearness at London, Ontario.

MYXOMYCETES

MYXOBACTERIACEAE

Chondromyces crocatus B. & C. On dung and old fungi in the laboratory ; University of Manitoba and M.A.C.

ACRASIEAE

Dictyostelium mucoroides Bref. On dung cultures ; University of Manitoba.

PLASMODIOPHORACEAE

Plasmodiophora Alni (Woronin) Moell. Forming galls on roots of Alnus ; Kenora. According to a recent investigator *P. Alni* is not a Plasmodiophora.

MYXOGASTRES (in collaboration with Dr. W. T. Elliott)

Arcyria cinerea (Bull.) Pers. Common at M.A.C. in 1927 ; on old leaves and poplar wood.

— **denudata** (L.) Wettst. Old wood ; M.A.C., Victoria Beach.

— **incarnata** Pers. Old wood ; M.A.C., Victoria Beach, Boissevain.

— **incarnata** var. **fulgens** Lister. River Park, Winnipeg.

— **insignis** Kalch. & Cke. M.A.C. Previously recorded in North America only from Massachusetts and Montana.

— **occidentalis** (Macbr.) Lister. On dead wood ; M.A.C. and collected by Cheeseman at Winnipeg.

— **stipata** (Schw.) Lister. Occasional on old wood ; M.A.C.

Badhamia decipiens (Curt.) Berk. Old poplar ; M.A.C.

— **macrocarpa** (Ces.) Rost. Kildonan Park, Winnipeg.

— **panicea** (Fr.) Rost. Elm Park, Winnipeg ; collected by Cheesman.

— **utricularis** (Bull.) Berk. On Polyporus ; Victoria Beach.

Ceratiomyxa fruticulosa (Muell.) Macbr. Fairly common on old wood ; M.A.C., Victoria Beach.

Comatricha irregularis Rex. Carmen ; A. R. Skinner.

— **typhoides** (Bull.) Rost. Old wood and leaves ; Winnipeg, M.A.C.

Craterium leucocephalum (Pers.) Dittm. Decayed wood, horse dung, leaves ; M.A.C., Victoria Beach, Norway House.

— **minutum** (Leers) Fr. Victoria Beach, M.A.C.

Dichaea bulbillosa (B. & Br.) Lister. Old wood ; Winnipeg. A rare species.

Dictydiaethalium plumbeum (Schum.) Rost. On Crataegus twigs ; M.A.C.

Dictydium cancellatum (Batsch) Macbr. Decaying wood ; M.A.C.

Diderma effusum (Schw.) Morg. Old leaves ; M.A.C.
— **globosum** Pers. On wood ; M.A.C., Winnipeg, Kenora.
— **radiatum** (L.) Morg. Dead wood ; Indian Bay, Lake of the Woods.
— **spumarioides** Fr. On leaves and wood ; M.A.C.
Didymium crustaceum Fr. Rotten poplar ; M.A.C.
— **difforme** (Pers.) Duby. Developed several times on horse dung brought into the laboratory ; M.A.C.
— **melanospermum** (Pers.) Macbr. Wood and bark of dead poplars, Viburnum, etc. ; M.A.C., Victoria Beach.
— **melanospermum** var. **minus** Lister. M.A.C.
— **squamulosum** (A. & S.) Fr. Common on old ash, willow, herbs, horse dung ; M.A.C., Victoria Beach, Norway House, Valley River.
— **vaccinum** Bouchet. On cow dung ; M.A.C. An uncommon species.
Enteridium Rozeanum (Rost.) Wing. Norway House, Kenora, Winnipeg.
Fuligo septica (L.) Gmel. Common and widespread.
— **septica** var. **candida** Pers. M.A.C., Victoria Beach.
Hemitrichia clavata (Pers.) Rost. Common on old wood and sawdust ; M.A.C., Victoria Beach, etc.
— **vesparium** (Batsch) Macbr. On dead elm, poplar, etc. ; M.A.C.
Lamproderma columbinum (Pers.) Rost. Old wood ; Victoria Beach.
— **scintillans** (B. & Br.) Morgan. On dead ferns ; M.A.C.
— **violaceum** (Fr.) Rost. Victoria Beach.
Leocarpus fragilis (Dicks.) Rost. On moss and wood ; Victoria Beach.
Licea fimicola Dearness and Bisby, n. sp. Plasmodia pinkish white. Sporangia scattered or gregarious, spindle-shaped to oval or roundish ; wall membranous, shining, even, reddish-purple at first becoming blackish-purple, 300–500 μ high by 125–200 μ wide, dehiscence irregular ; capillitium consisting only of occasional small smooth threads which may bear lime knots ; spores spherical, purplish but fading in liquid to slate or brown, marked by short superficial echinulations on one side, or irregularly dispersed in areas, remainder of spore smooth, 11–15 μ in diameter, sometimes larger. On old horse-dung culture in laboratory ; specimens gathered May 21, 1928, *3919* (D. *6658*) ; subsequently collected on same material, June 28, 1928, *4047*. Resembles *L. biforis* Morgan in possessing membranous sporangia.

Lycogala epidendrum (L.) Fr. Very common; Victoria Beach, M.A.C., etc.

— **flavo-fuscum** (Ehrenb.) Rost. Collected at Winnipeg by Cheesman.

Mucilago spongiosa (Leys.) Morg. Common; Winnipeg, M.A.C.

Oligonema nitens (Lib.) Rost. Old Salix and other wood; M.A.C.

Perichaena corticalis (Batsch) Rost. Common, especially on poplar bark; M.A.C., Victoria Beach.

— **depressa** Lib. On old wood; M.A.C.

Physarella oblonga (Berk. & Curt.) Morg. On old fungi; M.A.C.

Physarum auriscalpium Cke. Decayed wood; M.A.C.

— **bitectum** Lister. Poplar bark and old wood; M.A.C.

— **compressum** A. & S. Dead wood; M.A.C.

— **contextum** Pers. Old poplar, etc.; M.A.C., Winnipeg.

— **didermoides** (Achar.) Rost. Winnipeg Beach; W. N. Cheesman.

— **globuliferum** (Bull.) Pers. Dead poplar; M.A.C.

— **leucophaeum** Fr. On wood; Winnipeg, M.A.C.

— **maydis** (Morg.) Torrend. Old wood; M.A.C. Developed in laboratory from sclerotia.

— **mutabile** (Rost.) Lister. Herbaceous stems; Victoria Beach, M.A.C.; showing a relationship to *P. sessile*. No other known American record.

— **notabile** Macbr. Old poplar and other wood; common at M.A.C.

— **nutans** Pers. On débris and poplar wood; M.A.C.

— **nutans** var. **robustum** Lister. Dead bark; M.A.C.

— **rubiginosum** Fries. Old leaves, moss on wood; Victoria Beach. A rare species. Our specimens were reddish-brown to scarlet-orange.

— **sinuosum** (Bull.) Weinm. Moss, pine needles; Kenora, Winnipeg.

— **viride** (Bull.) Pers. Old poplar, etc.; M.A.C., Victoria Beach.

— **viride** var. **incanum** Lister. Decaying wood; M.A.C.

Reticularia Lycoperdon Bull. Old wood; Winnipeg, Victoria Beach, Minaki.

Stemonitis ferruginea Ehrenb. Gimli, Victoria Beach, Minaki.

— **fusca** (Roth.) Rost. Common on dead wood; M.A.C., Treesbank, Victoria Beach.

— **herbatica** Peck. Old poplar; M.A.C.

— **hyperopta** Meyl. On wood; M.A.C.

Trichia contorta (Ditm.) Rost. Old wood; Winnipeg, M.A.C.
— **contorta** var. **inconspicua** Lister. Winnipeg.
— **decipiens** (Pers.) Macbr. On wood; Winnipeg, M.A.C.
— **persimilis** Karst. Decayed wood; M.A.C.
— **scabra** Rost. Old wood; Indian Bay.
— (n) **subfusca** Rex. On dead wood; Victoria Beach.
— **varia** Pers. On wood; Winnipeg, M.A.C.
Tubifera Casparyi (Rost.) Macbr. Old Cornus; M.A.C.
— **ferruginosa** (Batsch) Gmel. Victoria Beach.

BACTERIA PARASITIC UPON CULTIVATED PLANTS

Bacillus amylovorus (Burr.) Trev. Injurious on apple; Morden, etc. First outbreak at M.A.C. in 1925.
— **atrosepticus** van Hall. Common on potatoes.
— **carotovorus** L. R. Jones. Common on celery and other hosts.
— **caulivorus** Prill. & Del. Frequent on geranium cuttings, Winnipeg.
— **oleraceae** Harr. On cabbage and cauliflower; Winnipeg, M.A.C. (Perhaps same as *B. carotovorus*.)
— **Sorghi** Burr. On Sudan grass and the sheaths of corn, M.A.C.
— **tracheiphilus** E.F.S. Reported on cucumber; sometimes confused with mosaic.
Bacterium Delphinii (E.F.S.) Bryan. On larkspur; Morden, Brandon, Winnipeg.
— **marginatum** McC. On Gladiolus; Winnipeg; A. M. Brown.
— **michiganense** (E.F.S.) Stev. On tomato; Brandon; I. L. Conners.
— **striafaciens** Elliott. Common on oat leaves; M.A.C. and elsewhere.
Pseudomonas atrofaciens (McC.) Stev. Occasional on wheat; M.A.C., Oakville.
— **campestris** (Pam.) E.F.S. Reported on crucifers.
— **coronafaciens** (Elliott) Stev. Not common on oats; M.A.C.
— **glycinea** Coer. (or *B. Sojae* Wolf). On soybeans; M.A.C.
— **lachrymans** (Sm. & B.) Cars. Common on cucumber leaves; Winnipeg, M.A.C.
— **Phaseoli** E.F.S. Often injurious to beans; Norway House, M.A.C.
— **Pisi** Sackett. On garden pea; M.A.C.

Pseudomonas radicicola (Bey.) Moore. On native as well as cultivated legumes.

— **translucens** J. J. & R. On barley leaves ; M.A.C.

— **translucens** var. **Secalis** R. G. & J. On rye leaves ; M.A.C.

— **translucens** var. **undulosa** J. J. & R. Common on wheat.

— **tumefaciens** (S. & T.) Stev. Occasional on cultivated roses and plums ; M.A.C., Brandon, Winnipeg.

PHYCOMYCETES

CHYTRIDIALES

Cladochytrium maculare (Wallr.) Graff. On Alisma ; Boissevain ; I. L. Conners.

Physoderma Menyanthes de Bary. On *M. trifoliata* ; Gimli ; T. Johnson.

Synchytrium aureum Schroet. On Petalostemon ; Brandon.

— **decipiens** Farl. (*Woroniella aecidioides* (Pk.) Syd.) On Falcata (Amphicarpa) ; common.

SAPROLEGNIALES

Have not been studied, but many have been observed.

PERONOSPORALES

Albugo Bliti (Biv.) Kze. Common on Amaranthus ; on Monolepis at Kelwood.

— **candida** (Pers.) Kze. Common on Bursa, Lepidium, Neslia, Norta, Radicula, Raphanus, Sinapis.

— **Portulacae** (DC.) Kze. Frequent on Portulaca.

— **Tragopogonis** (DC.) S. F. Gray. On Cirsium ; M.A.C., Ste. Rose.

Basidiophora Kellermanii (E. & H.) Wils. Common on Iva.

Bremia Lactucae Regel. On *L. pulchella* ; Swan River.

Peronospora alta Fckl. On Plantago ; M.A.C., Minaki, Brandon, Birtle. Common in 1928.

— **Arthuri** Farl. On Oenothera ; Virden, Killarney ; 1928.

— **Corydalis** de Bary. On *Capnoides sempervirens* ; Norway House ; 1928.

— **effusa** (Grev.) Rabh. On Chenopodium and Spinacea ; common.

— **parasitica** (Pers.) Tul. Common on Brassica, Bursa, Cheirinia, Lepidium.

— (n) **Polygoni** Thuem. Causing brown spots on rhubarb leaves ; Valley River.

— **Potentillae** de Bary. On Sieversia ; Griswold ; W. L. Gordon ; 1928.

— **Trifoliorum** de Bary. On Astragalus and Medicago ; Treesbank, M.A.C., Brandon.

Peronospora Viciae (Berk.) de Bary. On *V. americana*; Dauphin, M.A.C.

Phytophthora infestans (Mont.) de Bary. On potato; first found in 1927, widespread and injurious in 1928.

— **parasitica** Dastur. On Collomia; Reston; W. L. Gordon; 1928.

— **Thalictri** Wils. & Davis. On Thalictrum; M.A.C.; 1928.

Plasmopara Halstedii (Farl.) Berl. & deT. Common on Ambrosia, Bidens, Helianthus, Rudbeckia.

— **obducens** Schroet. On Impatiens; Swan River, Berens River.

— **ribicola** Schroet. On Ribes; Minaki, M.A.C.

— **Viburni** Pk. On *V. opulus*; M.A.C., Gimli.

— **viticola** (B. & C.) Berl. & DeT. On *Vitis riparia* (cult.); first found in 1927 at M.A.C. and Morden, but it did not survive the winter and was not found in 1928.

Pseudoperonospora Humuli (Miyabe & Taka.) Wilson. On *H. lupulus* (wild). This highly interesting mildew, reported previously for North America only from Wisconsin, was collected at M.A.C. on Sept. 9, 1928, and at Minaki, Ontario, Sept. 22, 1928. It is evidently a part of our native fungus-flora.

Pythium deBaryanum Hesse. Occasional on seedlings.

Sclerospora graminicola (Sacc.) Schroet. On Chaetochloa; Boissevain; common at Brandon in 1928.

MUCORALES

Chaetocladium Brefeldii van Tiegh. On dung cultures; M.A.C.

Mucor Mucedo (L.) Bref. A common coprophilous fungus.

— **racemosus** Fres. Often even more common than the preceding and distinguished from it by chlamydospores in the mycelium.

Phycomyces Blakesleeanus Burgeff (*P. nitens* Auct.) Uncommon in dung cultures; University of Manitoba.

Pilobolus crystallinus (Wigg.) Tode. On dung; Winnipeg, M.A.C.

— **Kleinii** van Tiegh. Rather common on horse-dung cultures; University of Manitoba.

— **longipes** van Tiegh. Common on dung; Winnipeg, M.A.C.

— **oedipus** Mont. This rarely-collected fungus was found on its typical habitat of algal remains on mud along the Red River, Winnipeg; C. W. Lowe.

Piptocephalis Freseniana de Bary. Parasitizing Mucors in dung cultures; University and M.A.C.

Rhizopus nigricans Ehr. Present everywhere; causes some losses to food products. Both plus and minus forms have been found producing zygospores in culture.

Syncephalis (n) **sphaerica** van Tiegh. On horse dung; M.A.C. Another species, unidentified, is found as a parasite of Pilobolus.

Syzygites Aspergillus (Scop.) Pound (*Sporodinia grandis* Link). Common on old mushrooms.

Thamnidium elegans Link. Occasional on dung cultures; University and M.A.C.

ENTOMOPHTHORALES

Empusa Aphidis Hoff. On aphids; M.A.C.

— **Muscae** Cohn. In its usual autumn prevalence on house-flies.

Entomophthora Grylli Fres. Sent in by Norman Criddle from Treesbank on Dissoteria, Melanopus, and Ctenucha.

— **virescens** Thaxt. On cutworms; M.A.C.

Tarichium megaspermum Cohn. On cutworms; M.A.C.

ASCOMYCETES

PROTOMYCETALES

Monascus purpureus Went. On silage; Brandon. Not commonly found. The silage and fungus were as described in Mycologia (II, 99), but the live-stock was not poisoned, perhaps because some care was taken not to feed the animals with the moldy portions. In Manitoba there have been a number of cases of death of live-stock from eating moldy sweet clover both as dry forage and silage; but, in the clover, no definite mold has been found as a characteristic inhabitant. We are inclined to agree with the veterinarians that split proteins or other components of the decaying substratum are the poisonous agents, rather than the fungi themselves, if indeed the fungi are involved at all.

SACCHAROMYCETALES

Many " wild " yeasts occur and cause fermentative injury to fruits, food materials, meat in storage, and slime flux in wounds of trees.

PROTODISCALES

Exoascus Cerasi (Fckl.) Sadeb. On *Prunus Besseyi* and the hybrid *Prunus Besseyi* × *P. triflora*; Morden, M.A.C.

— **Pruni** Fckl. Common on cultivated plums throughout Manitoba. Can be controlled by spraying.

Taphrina caerulescens (Mont. & Desm.) Tul. On oak leaves; common.

HELVELLALES

Cudonia circinans (Pers.) Fr. In deep fir woods; Victoria Beach, Minaki.

Gyromitra esculenta (Pers.) Fr. Recorded from Kenora. One of us (J. D.) investigated fatal poisonings at Aylmer and Tilsonburg, Ont., caused by eating this fungus.

Helvella crispa (Scop.) Fr. Common; Victoria Beach, Gimli, Kenora.

— **elastica** Bull. Mixed woods; Kenora.

— **infula** Schaeff. Common among conifers; often bearing Sphaeronemella.

— **Mitra** L. (*H. lacunosa* Afz.). Russell, M.A.C., Kenora, Victoria Beach.

— **sphaerospora** Pk. On decayed wood, not uncommon in the spring at Victoria Beach and Elk Island. Spores spherical; all the other known species of Helvella have elliptical spores.

Leotia lubrica (Scop.) Pers. In coniferous woods, Kenora.

— **lubrica** form **Lloydii** (Rehm) Durand. A greenish form; Minaki.

Mitrula irregularis (Pk.) Durand. Common; Kenora, Minaki, Victoria Beach.

Morchella augusticeps Pk. In woods; M.A.C., Victoria Beach.

— **conica** Pers. Wooded areas; M.A.C., Victoria Beach.

— **crassipes** (Vent.) Pers. Victoria Beach to M.A.C. and Minaki.

— **esculenta** (L.) Pers. Widespread in open woods in June.

Spathularia clavata (Schaeff.) Sacc. Norway House, Victoria Beach, Ingolf.

Underwoodia columnaris Pk. This interesting and rare fungus was found at M.A.C. in deciduous woods on July 13, 1927. Two cream-coloured horn-like specimens 15 and 20 cm. long were projecting for half their length from the leaf-mould. Three more specimens were found in the same spot on July 28, 1928, and several more on Aug. 1, 1928, about a mile from the first location.

Verpa bohemica (Krombh.) Schroet. Common in the woods at M.A.C. in mid-May, 1927 (Conners and Gordon); collected by W. F. Hanna about the same time at Edmonton, Alberta; not found since.

— **conica** (Muell.) Swarts. Hillside Beach, M.A.C.; May.

PEZIZALES

1. *Operculatae.*[1]

Aleuria aurantia (Pers.) Fckl. Ingolf, Minaki, etc.

Aleurina (n) **atrovinosa** (Cke.) Seaver. Damp soil ; M.A.C.

Ascobolus carbonarius Karst. On burnt soil ; M.A.C.

— **geophilus** Seaver. On damp soil ; M.A.C.

— **immersus** Pers. Common on dung in cultures ; Winnipeg, M.A.C.

— **stercorarius** (Bull.) Schroet. On dung ; Elk Island, Gimli, M.A.C.

— **striisporus** (Ell. & Dearn.) Seaver. Known only from Canada. First collected by one of us (J. D.) at London, Ont. ; collected three times at M.A.C. on old leaves in a slough as it dried up ; June to Aug.

Ascophanus carneus (Pers.) Boud. On dung of horse, cow, and goat ; M.A.C.

— **granulatus** (Bull.) Speg. On dung of cow and horse ; M.A.C.

— **lacteus** (C. & P.) Sacc. On dung of cow, horse, and rabbit ; M.A.C. 8–13 × 5–8.

Bulgaria melastoma (Sow.) Seaver. On old wood ; Victoria Beach.

Discina ancilis (Pers.) Sacc. On mossy wood ; Victoria Beach.

Geopyxis bronca (Pk.) Seaver. On much decayed wood ; Victoria Beach. Apparently rare.

— **cupularis** (L.) Sacc. On charcoal ; Kenora.

Humarina leucoloma (Hedw.) Seaver. Among mosses ; Minaki.

— **semiimmersa** (Karst.) Seaver. On damp soil ; M.A.C.

Lamprospora Constellatio (B. & Br.) Seaver. Damp soil ; Victoria Beach, M.A.C.

— **laetirubra** (Cke.) Lagarde. On sandy soil ; Victoria Beach.

Lasiobolus equinus (Muell.) Karst. On dung ; M.A.C.

Melastiza Charteri (W. G. Sm.) Boud. Common on sawdust in an emptied ice-house in autumn ; M.A.C.

Patella albida (Schaeff.) Seaver. Common ; Victoria Beach, Kenora, M.A.C.

— **albocincta** (B. & C.) Seaver. Among moss ; Kenora.

— **coprinaria** (Cke.) Seaver. On cow dung ; Victoria Beach, Black Island.

— **melaloma** (A. & S.) Seaver. On burnt ground ; M.A.C.

— **scutellata** (L.) Morg. Everywhere on old wood.

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[1] Names of species as in F. J. Seaver's *North American Cup fungi* (6).

Patella stercorea (Pers.) Weber. On cow dung; Victoria Beach, M.A.C., Brandon.

— **theleboloides** (A. & S.) Seaver. On sawdust and débris, with *Melastiza Charteri* ; M.A.C.

Paxina Acetabulum (L.) Kuntze. In woods ; M.A.C. ; July.

— **Corium** (Weberb.) Seaver. On sand in mixed woods ; Victoria Beach.

— **hispida** (Schaeff.) Seaver. On rotted logs ; Victoria Beach ; Aug.

— **sulcata** (Pers.) Kuntze. On the ground in woods ; M.A.C.

Perrotia flammea (A. & S.) Boud. On wood ; Victoria Beach ; June.

Peziza badia Pers. On soil or old wood ; Victoria Beach, M.A.C.

— **domiciliana** Cke. In a cellar ; M.A.C. ; Aug.

— **repanda** Pers. On old logs ; Victoria Beach, Ingolf, M.A.C. ; June, Aug.

— **sylvestris** (Boud.) S. & T. On sawdust and soil ; M.A.C. ; Aug.–Oct.

— **vesiculosa** Bull. On dung, etc. ; Norway House to M.A.C. and Kenora.

— **violacea** Pers. On charcoal ; M.A.C. ; Aug.

Plectania coccinea (Scop.) Fckl. (*Sarcoscypha coccinea*, " Scarlet Cup "). This conspicuous fungus has never been found in Manitoba, but it was sent in from North Dakota, one-half mile south of the Manitoba boundary, on Mar. 27, 1927, so that it is probably present in the extreme south of the Province. We could not have overlooked it, had it occurred around Winnipeg.

— **hiemalis** (Nees & Bernst.) Seaver (*Sarcoscypha protracta*). Sometimes abundant among poplars or in mixed woods ; Victoria Beach, Indian Bay, Darlingford, Winnipeg, M.A.C. We have also seen specimens gathered near Edmonton, Alberta.

Pseudoplectania fulgens (Pers.) Fckl. Amongst conifers; Victoria Beach ; May–June.

— **nigrella** (Pers.) Fckl. On decaying wood ; Victoria Beach ; May.

— **vogesiaca** (Pers.) Seaver. On old wood ; Victoria Beach ; June.

Psilopezia nummularia Berk. On wet leaves ; M.A.C.

Pyronema canina Dearness and Bisby, n. sp. Apothecia 1–3 mm. broad, gregarious but separate, urceolate at first, becoming saucer-shaped or flat, yellow then brown, finally dark-grey and retaining their open shape when dry, firm, sessile, seated on a delicate, thin, radiant tapesium consisting of hyaline, branching hyphae, 3–5 μ thick. Hypothecium thin, short-celled, brown. Asci cylindrical, 8-spored, 90–120 × 8–10 μ, not turning blue with iodine; paraphyses filiform, straight, equal of the asci, gradually enlarged to the slightly thickened ends. Spores 1-seriate, smooth, elliptic, nearly hyaline, 11–12·5 × 6–7 μ with one central oil drop 3–4 μ in diameter.

On dog dung; Norway House, Man.; Aug. 28, 1928; *4082* (D. *6719*). There is a rather abrupt change of colour from yellowish to brown as the apothecia mature; indeed, at first sight, one might easily suppose two species to be present.

Pyronema omphalodes (Bull.) Fckl. On charcoal; M.A.C.

Rhizina inflata (Schaeff.) Karst. Rare at Victoria Beach and Kenora.

Rhyparobius crustaceus (Fckl.) Rehm. On rabbit dung; M.A.C.

— **monascus** Mout. On dung of goat and rabbit; M.A.C.

— **polysporus** (Karst.) Sacc. On dung; M.A.C.

Saccobolus depauperatus (B. & Br.) Phill. On horse dung; M.A.C.

Scodellina grandis (Pers.) Seaver (*Otidea grandis*). On damp soil; Victoria Beach.

— **leporina** (Batsch) Gray. In woods; M.A.C., Victoria Beach, Minaki.

Urnula Craterium (Schw.) Fr. Victoria Beach, Indian Bay, M.A.C.; May.

2. *Inoperculatae.*

Catinella nigro-olivacea (Curr.) Boud. On old wood; Victoria Beach, M.A.C.

Cenangium furfuraceum (Roth) deNot. Common on hazel, occasionally on other shrubs.

— **populneum** (Pers.) Rehm. Common and variable on poplar, rare on ash; Victoria Beach, M.A.C.

— **populneum** var. **prunicolum** Rehm. On choke-cherry; M.A.C.

Chlorosplenium aeruginascens (Nyl.) Karst. On old wood; Victoria Beach, Kenora. 6–8 × 1·5–2.

— **aeruginosum** (Oed.) deNot. On old willow, etc.; Gimli, Victoria Beach, M.A.C. 10–13 × 2–2·5. Probably this species is also found at Norway House.

— **versiforme** (Pers.) deNot. On coniferous wood; Victoria Beach. 12–15 × 3–4.

Ciboria (n) **rufofusca** (Weberb.) Sacc. On spruce cones; Indian Bay.

Coryne sarcoides (Pers.) Fckl. On old poplar; Kenora, M.A.C., Indian Bay.

— **purpurea** Fckl. (possibly same as preceding). On wood; M.A.C.

Dasyscypha Agassizii (B. & C.) Sacc. Common on Abies; Victoria Beach, Kenora.

— **carestiana** (Rabh.) Sacc. On fern fronds; M.A.C.

— (n) **dryina** (Karst.) Sacc. On old wood; Matlock.

— **nivea** (Hedw. f.) Sacc. On deciduous wood; M.A.C.

— (n) **sporotricha** (Oud.) Rehm. Old sunflower stems; M.A.C.

Dermatea (n) **Cerasi** (Pers.) deNot. On old wood; Kenora.

— **Rubi** (Lib.) Rehm. On Cornus branches; M.A.C.

Geopyxis nebulosa (Cke.) Sacc. (A Ciboria according to Seaver.) On old wood; Matlock.

Helotium citrinum (Hedw.) Fr. Common; Norway House to M.A.C., Sifton to Kenora.

— **epiphyllum** (Pers.) Fr. On fallen leaves of poplar, etc.; Minaki.

— (n) **phyllophilum** (Desm.) Karst. Old leaves; M.A.C.

— **salicellum** Fr. On willow twigs; M.A.C.

Hysteropatella elliptica (Fr.) Rehm. On wood of willow; M.A.C.

— **Prostii** (Duby) Rehm. On elm, dogwood, etc.; M.A.C., Birds Hill.

Karschia lignyota (Fr.) Sacc. On Amelanchier; Kenora, St. Norbert, M.A.C.

Lachnella corticalis Fr. Common on poplar bark; Sifton to M.A.C.

— (n) **papillaris** (Bull.) Karst. On wood; Stony Mountain.

Lachnum bicolor (Bull.) Karst. On Ribes, Betula, etc.; Victoria Beach, M.A.C.

— (n) **nidulus** (S. & K.) Karst. Old thistle stems; M.A.C.

Leicographa (n) **franconia** Rehm. On old birch wood; Gimli.

Mollisia arundinacea (DC.) Phil. On Phragmites; Dauphin.

— (n) **atrocinerea** (Cke.) Phil. On old thistle and mint stems; M.A.C.

— **cinerea** (Batsch) Karst. Common on wood; M.A.C.

— **Dehnii** Karst. On living Potentilla; Dropmore, Carberry, Melbourne.

— (n) **rufula** Sacc. On old grass; Brandon.

Patellaria atrata (Hedw.) Fr. Common on old poplar, ash, etc.; M.A.C.

— **clavispora** B. & Br. On old Cornus; M.A.C.

Patellea sanguinea (Pers.) Rehm. On dead oak wood; M.A.C.

Pezizella (n) **viridoflavescens** Rehm. Old wood; M.A.C., Birds Hill.

Phialea amenti (Bat.) Quel. On poplar catkins; Indian Bay M.A.C.

— **cyathoidea** (Bull.) Gill. Common on old herbaceous stems; M.A.C.

— **fructigena** (Bull.) Gill. On fallen acorns; M.A.C.

— (n) **scutula** (Pers.) Gill. On old Polygonum stems; M.A.C.

— **vulgaris** (Fr.) Rehm. On dead wood and twigs; Victoria Beach, M.A.C.

Pseudopeziza Medicaginis (Lib.) Sacc. Common on alfalfa and slightly injurious.

— **repanda** (Fr.) Karst. On Galium; M.A.C. and Birds Hill.

— **Trifolii** (Bernh.) Fckl. On clover; Minaki; I. L. Conners.

Pyrenopeziza (n) **compressula** Rehm. On old nettle; M.A.C.

— **Medicaginis** Fckl. Occasional on alfalfa; M.A.C.

Sclerotinia Betulae Wor. On fallen birch catkins; Indian Bay.

— **americana** (Wormald) Norton & Ezekiel. On cultivated plums and cherries; M.A.C., Morden, Brandon. Not serious.

— **sclerotiorum** (Lib.) Mass. Often injurious to sunflowers, lettuce, carrots, parsnips, and cabbage in the field or in storage; occasionally on cucumber, dahlia, clover, alfalfa; may attack weeds such as nettle, thistle, sow-thistle. Widespread.

— **pseudotuberosa** Rehm. A specimen on a blackened acorn; M.A.C.

Tapesia Rosae (Pers.) Fckl. On old rose stem; M.A.C.

Trichopeziza albolutea (Pers.) Sacc. On old wood; M.A.C.

Tympanis pinastri Tul. On coniferous wood; Kenora.

— **spermatiospora** Nyl. (*T. populina* (Fckl.) Sacc.) On dead poplar bark; M.A.C.

PHACIDIALES

Cryptomyces Pteridis (Reb.) Rehm. On *Pteris aquilina*; Minaki.

Ocellaria ocellata (Pers.) Schroet. Occasional on Salix twigs; M.A.C.

Ostropa cinerea (Pers.) Fr. Common on poplar, oak, ash, elm, willow; M.A.C.

Propolis faginea (Schrad.) Karst. On poplar, ash, oak; Kenora, M.A.C.

Rhytisma acerinum (Pers.) Fr. On planted maples ; M.A.C., Portage.

— **Andromedae** Fr. On *A. polifolia* ; Norway House.

— **punctatum** (Pers.) Fr. On *Acer spicatum* ; Victoria Beach, Kenora.

— **salicinum** (Pers.) Fr. Everywhere on willow leaves.

Schizoxylon compositum E. & E. On Crataegus and Acer; M.A.C.

— **insigne** (de Not.) Rehm. On Prunus twigs ; M.A.C.

— (n) **sepincola** Pers. On Picea twigs ; Gimli.

Stictis fusca Ell. & Barth. On Viburnum twigs ; M.A.C.

— **mollis** Pers. On Viburnum ; M.A.C.

— (n) **pachyspora** Rehm. On Acer twigs ; M.A.C.

— **radiata** Fr. On Viburnum at M.A.C., perhaps also on poplar at Victoria Beach.

Stictis curtispora, Dearness and Bisby, n. sp. Apothecia 0·75–1 mm., slaty-gray, rim broken-incurved, not stellate, disc whitish-blue-pruinate. Asci 60-75 × 8–9 μ, cylindric, turning blue with iodine, rounded on top, sessile on a pseudo-parenchymatic basal layer 15–30 μ thick ; paraphyses linear, short-branched at the tip forming a whitish epithecium. Spores straight, linear, 6–8-celled, hyaline, 28–40 × 2 μ. On dead branches of Populus ; M.A.C., Winnipeg, Jan. 9, 1926. *2610* (D. *5972*).

HYSTERIALES

?**Dichaena Populi** Dearness and Bisby n. sp. On large galls on poplar branches, resembling those of *Dichaena quercina* on oak. Perithecia or irregular subglobose apothecia numerous. Asci, 65–80 × 9–10 μ, containing immature or partly formed hyaline spores about one-third as long as the asci in the distorted but yet living cortex of the galls. Crescentic stylospores up to 30 × 3–4 μ are perhaps associated. The galls are irregularly globose, up to 6 cm. thick, formed around the forking of half-inch thick branches. The natural colour of the bark is blackened with the perithecia.

On *Populus balsamifera* ; Winnipeg ; June 2, 1924. V. W. Jackson, *1822* (D. *6621*). Gimli ; May 7, 1928. Pycnidia present with spores 18–28 × 1·2–1·5 μ ; also perithecia with imperfect asci. G. R. Bisby *3894*.

The relation of the fungus to the gall remains an open question. A very similar, disfiguring and destructive gall was collected by Mr. R. C. Russell at Humboldt, Sask., on *Populus tremuloides* which bore a different fungus on its surface—*Dothiorella gallicola* Dearn. *in litt.*

Glonium stellatum Muhl. On old Abies log ; Victoria Beach.

Graphyllium manitobiense Dearness and Bisby n. sp. Hysterothecia black, linear, 0·3–2 mm., longer by confluence, very narrow, 40–85 μ across, wall thin, almost membranous, opening by a relatively wide cleft, contents whitish at first and in long section seeming pseudolocellate ; as many as 10 asci-origins not visibly separated by partition-walls were observed in a section 250 μ long. Asci various in shape, some ovate, 45 × 24 μ with spores conglobate ; others short-cylindric 65–75 × 20 μ with spores biseriate, still others long-cylindric up to 120 × 15 μ with spores obliquely uniseriate ; walls thick up to 7 μ at top ; paraphysate. Spores muriform, brown, 3–7-septate, mostly 5–6-septate, with one longitudinal septum extending from end to end, variable in size and shape, mostly oblong-elliptic, 20–25 × 8–10 μ (12 × 5 μ, 27 × 12 μ, 30 × 6 μ are variations of apparently mature sporidia).

On dead stems of Phragmites ; Brandon, Man. ; May 28, 1924, I. L. Conners. G.R.B. *3915* (D. *6656*).

Graphyllium graminis (E. & E.) Rehm, as illustrated in Brenckle's *Fungi Dakotensis 312,* is externally indistinguishable, but the asci and sporidia are quite distinct.

Hypodermella ampla (Davis) Dearn. On pine needles ; Elk Island.

Hysterium (n) **insidens** Schw. On Celastrus ; M.A.C.

— **pulicare** (Pers.) Fr. Common on old bark of birch trees ; Victoria Beach, Indian Bay.

Hysterographium Fraxini (Pers.) de Not. Very prevalent, perhaps semi-parasitic, on ash twigs everywhere. It may be collected in good fruit in any month of the year. Dead branches attached to ash trees always bear this fungus at M.A.C., so that it is of value in a diagnosis of the host. It occurs on both native species of Fraxinus, but has been found on no other hosts except for a rare weak development on *Viburnum Lentago* and *V. Opulus.*

— **Mori** (Schw.) Rehm. Also very common, especially on decorticated stumps and chips of willow, poplar, oak, Amelanchier and, rarely, on coniferous wood. Norway House, Victoria Beach, M.A.C.

Lophium mytilinum (Pers.) Fr. On old pine boards and Larix chips ; M.A.C., Birds Hill.

— (n) **mytilinellum** Fr. Hysterothecia only 0·2–0·4 mm. long, spores 90–120 × 1·5–2 μ, on coniferous bark ; Norway House.

Lophodermium pinastri (Schrad.) Chev. On pine ; Norway House, Elk Island.

Mytilidion fusisporum (Cke.) Sacc. On coniferous wood ; Norway House.

TUBERALES

Tuber separans Gilkey. One specimen was found in Assiniboine Park, Winnipeg, by C. W. Lowe, Sept. 1922.

ASPERGILLALES

Eurotium herbariorum (Wigg.) Link. On damp specimens and cultures ; Winnipeg.

Gymnoascus (n) **Reessii** Baran. On a dung culture ; M.A.C.

Onygena equina (Willd.) Pers. Occasional on old horns.

— **corvina** A. & S. Collected on feathers ; Minaki.

PERISPORIALES

Apiosporina Collinsii (Schw.) v. Höhn. (Dimerosporium). Causes a common and injurious witches' broom on Amelanchier.

Asterina (n) **nuda** Pk. On Abies needles ; Elk Island.

— **rubicola** E. & E. On raspberry leaves ; Winnipeg ; W. Popp.

Erysiphe Cichoracearum DC. Widespread ; collected on Ambrosia, Aster, Galium, Helianthus, Lappula, Mentha, Plantago, and Rudbeckia.

— **Galeopsidis** DC. On Stachys ; Ste. Rose, M.A.C.

— **graminis** DC. Common on Agropyron, Agrostis, Hordeum, Phleum, Poa, Secale, and Triticum. Injury in the field seen only on rye, and that slight.

— **Polygoni** DC. Found on Amphicarpa, Caltha, Delphinium, Glycyrrhiza, Lathyrus, Pisum, Polygonum, Thalictrum, and Trifolium. Injurious to larkspur. First appeared on red clover in 1922 ; injurious in 1923 ; somewhat less prevalent since. Physiologic specialization evident in the field.

Halbaniella (Asteridium) Linnaeae Dearness n. sp. Perithecia flat, circular, carbonous, ostiolate, minute, 100–120 μ, amphigenous, seated on hyaline anastomosing hyphae which form a narrow fringe not visible under a hand-lens, 50–60 μ wide around the perithecia. Asci globose to subobovate, 20–27 × 12–15 μ, aparaphysate. Spores hyaline, slightly curved, 3-septate, 13–18 × 3 μ. On living and withered leaves of *Linnaea borealis* var. *americana* ; Victoria Beach, Man. ; June 23, 1928. G. R. Bisby, I. L. Conners, and T. Johnson. *4037*. Also at Newcomb, N.Y., June, 1922, H. D. House. (D. *5059*).

Microsphaera Alni (Wallr.) Wint. On Alnus, Corylus, Syringa, Viburnum. Widely distributed.

— **Alni** var. **Lonicerae** (Schlecht.) Salmon. Morden, Victoria Beach, Gimli.

— **calocladophora** Atk. On oak; M.A.C.

— **diffusa** Cke. & Pk. On Lathyrus; Sifton, Winnipeg, M.A.C.

— **Symphoricarpi** Howe. On *S. occidentalis*; M.A.C.

Oidium Chrysanthemi Rob. Troublesome in greenhouses.

Phyllactinia corylea (Pers.) Karst. On Betula, Celastrus, Cornus, Corylus; Victoria Beach, M.A.C.

Podosphaera Oxyacanthae (DC.) de Bary. On Prunus, often injurious; Amelanchier; Valley River, M.A.C., Morden, Kenora.

Sphaerotheca Humuli (DC.) Burr. On Agastache, Fragaria, Geum, Humulus, Rhus, Rosa, Rubus. Common.

— **Humuli** var. **fuliginea** (Schlecht.) Salmon. On Bidens, Lepargyrea, Leontodon (Taraxacum), Viola; Swan River to M.A.C.

— **mors-uvae** (Schw.) B. & C. Common since 1925 on cultivated black currant, often injurious; found also on wild black currant; Victoria Beach.

— **pannosa** (Wallr.) Lev. Conidia attributed to this fungus on cultivated roses; M.A.C., Holland.

Uncinula circinata C. & P. On *Acer spicatum*; Victoria Beach, Kenora; from Minaki with many 4-spored asci and the spores about double the usual size.

— **necator** (Schw.) Burr. On Virginia creeper; Bethany, M.A.C.

— **parvula** C. & P. or a form, on wild strawberry; M.A.C. Agrees with description except that the appendages are rather too long and thick.

— **Salicis** (DC.) Wint. Common on poplars and willows everywhere.

HYPOCREALES

Calonectria Dearnessii E. & E. (perhaps the same as *C. diminuta* (Berk.) B. & V.). On Massaria on Amelanchier; M.A.C. Spores 21–28 × 6–7 μ, becoming 3-septate.

Chromocrea gelatinosa (Tode) Seaver. On willows; M.A.C.

Claviceps purpurea (Fr.) Tul. Collected on Agropyron, Bromus, Calamagrostis, Dactylis, Elymus, Hordeum, Panicularia, Phalaris, Phleum, Poa, Scolochloa, Secale, Spartina, Stipa, and Triticum. Norway House and southward. Injurious to rye in damp summers and causing dockage at the elevators. Common on wild grasses, especially Agropyron, from which rye and wheat doubtless receive spores. Not common on barley, not observed on oats. Durum wheats sometimes badly infected; occasional on the wheat varieties "Ruby" and "Garnet," but rare on "Marquis." There can scarcely be grounds for Chifflot's variety *Tritici* (*Bull. Soc. Myc. France*, 34: 192) and still less basis for his calling it "Claviceps Tritici Manitobae" (*Bull. Soc. Path. Veg. France*, 5: 80; see *Bot. Abs.*, 3: 378). Livestock sometimes poisoned, especially when fed with rye screenings. A farmer in Western Manitoba thus lost 30 head of cattle, and an investigation showed that he was feeding ground screenings containing 500 grains of ergot to the gallon, at the rate of two gallons per day.

Cordyceps clavulata (Schw.) E. & E. On Lecanium; M.A.C.

— **militaris** (L.) Link. Reported on grubs; Treesbank, N. Criddle.

Creonectria purpurea (L.) Seaver (*Nectria cinnabarina*). Widespread; on Celastrus, Prunus, Ribes, Spiraea, etc.

Eleutheromyces subulatus (Tode) Fckl. On old mushrooms and polypores; Norway House, Victoria Beach.

Epichloe typhina (Pers.) Tul. On grass, rare; M.A.C.

Gibberella Saubinetii (Mont.) Sacc. On old corn stalk; M.A.C. Only the Fusarium stage so far has been found on wheat.

Hypocrea chionea E. & E. On old wood; M.A.C. Previously reported only from London, Ont.

— **citrina** (Pers.) Fr. On Fomes and Polyporus; Victoria Beach, Ingolf.

— **patella** C. & P. On poplar, old Hypoxylon, etc.; St. Norbert, M.A.C.

— **pallida** E. & E. On old *Polyporus pubescens*; Kenora.

— **rufa** (Pers.) Fr. On old wood, probably poplar; M.A.C.

Hypomyces apiculatus (Pk.) Seaver. Old wood; M.A.C.

— **aurantius** (Pers.) Tul. On old Polyporus; Victoria Beach, M.A.C.

— **lactifluorum** (Schw.) Tul. Common about Winnipeg on Lactarii, especially *L. piperatus* (q.v.).

— **rosellus** (A. & S.) Tul. On old fungi; Gimli, M.A.C.

Melanospora lagenaria (Pers.) Fckl. On old Fomes; Victoria Beach. Asci evanescent; spores 10–13 × 6–8 μ.

Nectria episphaeria (Tode) Fr. On Eutypa, Diatrype, etc.; Kenora, M.A.C.

— **Peziza** (Tode) Fr. On old wood; Winnipeg, M.A.C.

Peckiella viridis (A. & S.) Sacc. On Russula, Lactarius; Victoria Beach, Minaki, M.A.C.

Scoleconectria balsamea (C. & P.) Seaver. Common on Abies; Minaki, Kenora, Victoria Beach.

Thyronectria berolinensis (Sacc.) Seaver. On Ribes; M.A.C.

DOTHIDIALES

Curreyella Bisbyi Dearness n. sp. Stromata black, erumpent, encinctured by the cuticle, seated in the cortex, circular or irregular or confluent, 0·5–2 mm., mostly about 1 mm. in diameter and 0·25 mm. thick. Loculi 6–15 in a stroma, nearly globose, 125–160 μ, exceptionally up to 250 μ. Asci thick-walled, cylindric-clavate, 75–100 × 12–16 μ. Sporidia hyaline, at first 2-celled and constricted, upper cell much the larger, each cell becoming 2–3-trans-septate with one long-septum, the whole spore bluntly paxillate, dictyosporous, constricted in the middle, 20–28 × 7–10 μ across the upper cell, 5–6 μ across the lower one.

On dead branches of Fraxinus sp.; G. R. Bisby and W. L. Gordon; Apr. 22, 1928; M.A.C. *3857* (D. *6547*).

Curreya Rehmii Schnabl on Ribes has some similar features.

Dibotryon morbosum (Schw.) T. & S. Causes Black-knot, widespread on Prunus, especially choke-cherry.

Dothidea ribesia Fr. On Ribes; M.A.C.

Montagnella Heliopsidis (Schw.) E. & E. Immature on (?) Aster; Gretna; C. W. Lowe.

Phyllachora graminis (Pers.) Fckl. On Agropyron, Elymus, Muhlenbergia, Panicum; Dauphin to M.A.C.

— **Heraclei** (Fr.) Fckl. On *H. lanatum*; Winnipeg Beach.

SPHAERIALES

Chaetomiaceae

Chaetomium bostrychodes Zopf. On dung of sheep and goat; M.A.C.

— **elatum** Kunze. Common on old wheat straw and débris.

— **murorum** Cda. On old wood and dung; M.A.C.

Sordariaceae

Delitschia insignis Mouton. This fine species is apparently a new record for North America. Found first in Belgium, and later in England (Massee and Salmon, *Ann. Bot.*, 15 : 344, 1901). The spores are 40–58 × 12–18 μ in our material, and are provided with hyaline appendages extending about 10 μ beyond each of the two cells of the spore. On old horse dung in culture at M.A.C.

— **Marchalii** Berl. & Vogl. On rabbit dung; M.A.C.

Fimetaria bombardioides (Auersw.) Griff. & Seaver. Agrees except that the spores are only 12–25 × 8–12 μ. Collected, as was the type, on rabbit dung ; M.A.C.

— **fimicola** (Rob.) Griff. & Seaver. Common on dung ; M.A.C.

Pleurage adelura Griff. On horse dung ; M.A.C. Asci 64-spored ; differs from type in that the spores are smaller, being 19–21 × 11–12 μ.

— **albicans** (A. & S.) Griff. (*P. coprophila* (Fr.) Kze.) On horse dung.

— (n) **anserina** (Ces.) Kuntze. On horse dung ; M.A.C.

— **collapsa** Griff. Common on dung of rabbit and goat.

— **conica** (Fckl.) Griff. & Seaver. On dung of rabbit and goat ; M.A.C.

— **curvicolla** (Wint.) Kuntze. On dung of sheep and goat ; M.A.C.

— **decipiens** (Wint.) Kuntze. On horse dung ; M.A.C.

— **heterochaeta** Griff. On horse dung, M.A.C. Asci 16-spored ; spores 30–32 × 16–18 μ.

— **minuta** (Fckl.) Kuntze. On old dung ; M.A.C.

— **taenioides** Griff. On dung of horse and goat ; M.A.C.

— **tetraspora** (Wint.) Griff. On rabbit dung ; M.A.C.

— **vestita** (Zopf) Griff. On dung of horse and goat ; M.A.C.

Sporormia coryneospora Niessl. On horse dung ; M.A.C. Spores 8-celled, third cell larger, 45–52 × 8–9 μ.

— **intermedia** Auersw. On cow dung ; M.A.C.

— **lata** Griff. On rabbit dung ; M.A.C. 44–50 × 17–20 μ.

— **leporina** Niessl. On rabbit dung ; M.A.C. 28–35 × 5–6 μ.

— (n) **leptosphaerioides** Speg. On old plum pits ; M.A.C. Another species with 8-celled spores on same substratum.

— **megalospora** Auersw. On cow dung ; M.A.C.

— (n) **minima** Auersw. On dung of cow and rabbit ; M.A.C.

— **tuberculata** Griff. On rabbit dung ; M.A.C.

Sphaeriaceae

Acanthostigma scopula (C. & P.) Pk. On old pine wood ; Kenora.

Bertia moriformis (Tode) de Not. On alder ; Norway House.

Bertiella (n) **botryosa** Morg. On rotten wood ; M.A.C. Asci 70–90 × 7–8 μ ; spores biseriate, 5–8-septate, 28–34 × 3–4 μ.

Chaetosphaeria (n) **atrobarba** (C. & E.) Sacc. On old poplar ; M.A.C.

Lasiosphaeria canescens (Pers.) Karst. On dead Cornus ; M.A.C.

Lasiosphaeria hirsuta (Fr.) Ces. & de Not. Common on Acer, Populus, Salix ; M.A.C.

— **hispida** (Tode) Fckl. On old poplar ; M.A.C.

— **ovina** (Pers.) Ces. & de Not. Old Salix and Populus ; M.A.C.

— **spermoides** (Hoff.) Fckl. On rotten poplar ; M.A.C.

— **strigosa** (A. & S.) Sacc. On old wood ; M.A.C.

— (n) **sublanosa** (Cke.) E. & E. On decaying wood ; M.A.C.

— **viridicoma** (C. & P.) Sacc. (= *Lophiotricha viridicoma* (C. & P.) Kauff.). On old wood ; Victoria Beach.

Melanomma pulvis-pyrius (Pers.) Fckl. Reported by Cheesman (1909) from Elm Park, Winnipeg.

Melanopsamma subfasciculata (Schw.) E. & E. (or a variety, the spores being 34–36 × 8–10 μ). On old *Vitis vulpina* ; M.A.C.

Rosellinia ligniaria (Grev.) Sacc. On Prunus and Quercus ; M.A.C., Birds Hill.

— **mammiformis** (Pers.) Sacc. On dead Cornus ; M.A.C.

— **medullaris** (Wallr.) Ces. & de Not. Old wood ; M.A.C.

— **parasitica** E. & E. On Symphoricarpos and Populus ; M.A.C.

— **subcompressa** E. & E. Old wood ; M.A.C.

Ceratostomataceae

Ceratostoma brevirostre (Fr.) Sacc. Old Populus ; M.A.C. 14–16 × 4 μ.

Cucurbitariaceae

Cucurbitaria Berberidis (Pers.) Gray. Common at M.A.C. on *Berberis vulgaris* and *B. Thunbergii.*

— **elongata** (Fr.) Grev. Common on Amorpha (*C. Amorphae*), Caragana, Cotoneaster ; M.A.C. Camarosporium usually associated.

Otthia hypoxyloides E. & E. On decayed wood ; M.A.C.

Amphisphaeriaceae

Amphisphaeria (n) **albomaculans** (Schw.) Cke. On white areas on old wood ; M.A.C. Spores 9–14 × 4–5 μ.

— **applanata** Cke. Common on outer bark of oak trees ; M.A.C.

— (n) **bispherica** (C. & E.) Sacc. On old poplar bark ; M.A.C. Similar to *Fungi Columb. 1318.*

Teichospora clavispora E. & E. On old *Acer Negundo* ; M.A.C.

— **insecura** (Ell.) E. & E. A form on Prunus ; M.A.C. 16–23 × 8–11 μ.

Teichospora megastega E. & E. On dead Salix; M.A.C. Like the next, but larger throughout.

— **obducens** (Fr.) Fckl. On old elm and oak twigs; M.A.C.

— **populina** E. & E. On decorticated poplar; M.A.C. *T. kansense* and *T. pygmaea* are very similar.

— **pruniformis** Nyl. On Populus; M.A.C. Very similar to the three mentioned in the last entry, although *T. pruniformis* has larger perithecia.

— (n) **pygmaea** E. & E. On poplar; M.A.C. Perhaps a small form of one of the preceding.

Lophiostomataceae

Lophiosphaeria pulveracea Sacc. On old board; M.A.C.

Lophiostoma Arundinis (Fr.) Ces. & de Not. On old Phragmites; Lake Dauphin.

— **erosum** E. & E. On Salix; M.A.C., Elk Island.

— **quadrinucleatum** Karst. On old Acer; M.A.C. This species may be only a form of *L. triseptatum.*

— **sexnucleatum** Ckc. On Salix; M.A.C.

— **triseptatum** Pk. Very common on old wood of deciduous trees.

— **vestitum** Pk. On old poplar; M.A.C.

Mycosphaerellaceae

Mycosphaerella Chimaphilae (E. & E.) Dearn. On *C. umbellata*; Victoria Beach. Spores 10–12 × 2·5–3 μ.

— **Fragariae** (Schw.) Lindau. On strawberry. *Ramularia Tulasnei,* the conidial stage, is common.

— **rubina** (Pk.) Jacz. Causes Gray bark. The conidial stage is fairly common on raspberry stems.

— **Thalictri** E. & E. On *T. dioicum*; M.A.C.

Pleosphaerulina briosiana Pol. On alfalfa; Brandon.

Pleosporaceae

Ceriospora manitobiensis Dearness and Bisby. Perithecia scattered, erumpent, sometimes only the short-beaked ostiolum visible through a rift of the bark, seated on the cortex, black, membranous, 170–190 μ in diameter. Asci saccate-cylindric, curved to fit the globose mass, adnate to the base of the perithecium, central ones subclavate, all short-stipitate, 50–86 × 12–21 μ with stipe up to 15 × 4 μ; immature asci thick-walled, the immature apex up to 15 μ thick; paraphysate. Spores 2–4-seriate, each with 4–6 fuliginous-brown cells and an acute, hyaline cusp at each end lacking a setal prolongation when fully matured, total length 30–38 μ including the two similar cusps each of about the length of an interior cell; width 5–7 μ, slightly curved but straight in the central asci.

On bark of dead twigs of *Lonicera canadensis*; Birds Hill, Man.; Aug. 11, 1927. W. L. Gordon and G. R. Bisby. *3659* (D. *6488*).

Didymella canadensis E. & E. On Salix, Populus; M.A.C.

Didymella manitobiensis Dearness and Bisby, n. sp. Perithecia black, thin-walled, thickly scattered or closely seriate in longitudinal lines, seated in the cortex, slightly elevating the epidermis through which the short, papillate ostiola are scarcely visible without a lens, 0·3–0·4 mm. in diameter. Asci narrowly cylindrical, attenuated at both ends, 8-spored, 75–105 × 7–10 μ, mostly 80–85 × 7·5 μ; paraphyses linear, abundant. Spores hyaline, two-celled, with two guttae on each side of the septum, narrowly sigmoid-fusoid, overlapping or subbiseriate, 30–42 × 3·5–5 μ, mostly about 30 × 4 μ, usually long attenuated at each end to a width of less than 1 μ. On dead twigs of *Viburnum Opulus*; M.A.C., Winnipeg, April 10, 1927. *3334* (D. *6333*). *Rhabdospora Viburni-opuli* may be the pycnidial stage.

Didymosphaeria diplospora (Cke.) Rehm. On Rosa, Cornus; M.A.C. What seems to be a form of this occurs on oak with somewhat shorter asci (68 μ) and more rounded spores; M.A.C.

— **epidermidis** Fr. On *Viburnum Lentago*; M.A.C.

— **manitobiensis** E. & E. Type collected on Rubus in Manitoba, as recorded in *N.A. Pyrenomycetes* (7), p. 732.

Leptosphaeria avenaria Weber. On oats (cult.); Brandon; I. L. Conners.

— **borealis** E. & E. On Cornus, Viburnum; M.A.C.

— **Coniothyrium** (Fckl.) Sacc. Occasionally found on raspberry; M.A.C.

— **consimilis** E. & E. Common on Salix; M.A.C. A variety with membranous perithecial walls is sometimes found on this host.

— **culmicola** (Fr.) Awd. On old straw; M.A.C.

— **doliolum** (Pers.) Ces. & de Not. Common on old herbaceous stems of Aster, Dracocephalum, Helianthus, Sonchus, Urtica; M.A.C.

— (n) **odora** (Cke. & Hark.) Sacc. On Symphoricarpos; M.A.C.

— (n) **puteana** Ell. & Kell. On old board; Birds Hill.

Leptosphaeria pyrenopezizoides Sacc. & Speg. On herbaceous stem at Victoria Beach, and a form on old coniferous wood at Birds Hill.

Leptosphaeria rugosa Dearness and Bisby, n. sp. Perithecia scattered, erumpent, raising the cuticle into pustules which are cleft exposing the large, shallow, obtuse, variable ostiola and the rugose surface, seated on the cortex, sometimes two or rarely more confluent, mostly about 0·5 mm. in diameter. Asci linear-cylindric, varying to clavate, sessile or briefly stipitate, 115–140 × 11–15 μ, densely paraphysate. Spores brown, 1–3-septate, constricted at all the septa, one or both ends sometimes sub-acute, at other times rounded, uniseriate, obliquely overlapping, or sub-biseriate, 18–27 × 6–9 μ.

On dead stems of *Cornus stolonifera*; M.A.C., Winnipeg; May 6, 1926. *2737* (D. *6077*). The imperfectly described *L. olivaespora* (B. & C.) Sacc. and *L. platycarpa* Sacc. may not be different; authentic material is needed to determine this. Related to *L. vagabunda.*

— **subconica** (C. & P.) Sacc. On old Sonchus; M.A.C.

Metasphaeria anisometra (Cke. & Hark.) Sacc. On *Viburnum pubescens*; M.A.C.

— **corylina** Ell. & Holw. This fine species is common in bark of Corylus; M.A.C. Spores 3-septate, 28–34 × 10–13 μ.

— **cumana** (Sacc. & Speg.) Sacc. Old Carex; M.A.C.

— **Dearnessii** Bubak. Common on living leaves of *Smilax herbacea*; M.A.C.

— (n) **hyalospora** Sacc. On old straw; M.A.C.; I. L. Conners.

— **leiostega** (Ell.) Sacc. On old Pyrus, Ribes, Rosa; M.A.C.

Metasphaeria querna Dearness and Bisby, n. sp. Perithecia carbonous, hemispheric, immersed in the cortex or erumpent, or almost superficial on the bare wood, 0·3–0·4 mm. in diameter, 0·2–0·25 mm. deep; ostiola large, papillate. Asci clavate, stipitate, 8-spored, 90–130 × 12–15 μ; paraphyses numerous, much exceeding the asci. Spores hyaline becoming amber-coloured, mostly biseriate, fusiform, 4–5-septate, usually with a large gutta in each cell, 24–30 × 6–8 μ. On dead branches of *Quercus macrocarpa*; M.A.C., Winnipeg; Mar. 10, 1927. *3295* (D. *6315*).

Ophiobolus acuminatus (Sow.) Duby. On old *Castilleja coccinea*; near Roblin.

Ophiobolus fulgidus (C. & P.) Sacc. Common on old stems of Aster, Solidago, Erigeron ; M.A.C., Brandon.

— **graminis** Sacc. Widespread in wheat-growing areas of Manitoba.

— **porphyrogonus** (Tode) Sacc. On dead stems of Cirsium and Melilotus ; M.A.C.

Physalosporina megastoma (Pk.) Woronich. On living leaves of Astragalus ; Brandon ; W. L. Gordon.

Pleospora (n) **herbarum** (Pers.) Rab. On Salix ; M.A.C.

— **pustulans** E. & E. On Cornus, Amelanchier, Lonicera ; M.A.C., Birds Hill, St. Norbert.

Pyrenophora calvescens (Fr.) Sacc. Old Melilotus ; M.A.C. Spores variable in size, 25–36 × 8–12 μ.

Pyrenophora rugosa Dearness and Bisby, n. sp. Perithecia scattered or thickly gregarious, nearly superficial among the fibres of the bare wood, rugose but shining, single or two or three joined together, 150–300 μ in diameter, subglobose ; bristles few to many (10 to 60 or more), scattered but mainly equatorial, dark-brown, long and narrow, 150–175 μ by 4–5 μ at base, tips acute, paler. Asci 2-, 4-, or 8-spored, clavate to clavate-cylindrical, 100–145 × 18–27 μ, stipe 10–30 μ long ; paraphyses present but not abundant, linear. Spores uniseriate or biseriate in upper part of ascus, yellowish-brown to dark-brown, oblong-elliptic, sometimes curved, upper half often wider, constricted at one or sometimes at three of the septa, transversely 5–7-septate, usually with one partial longitudinal septum, 24–36 × 11–15 μ. On an old barrel stave ; M.A.C., Winnipeg ; Oct. 19, 1923. *3234* (D. *6284*).! A red stain in the wood is associated with this fungus but not certainly caused by it.

Venturia compacta Pk. Immature ; on living leaves of *Vaccinium canadense* ; Norway House.

— **Dickiei** (B. & Br.) de Not. On leaves of *Linnaea borealis* var. *americana* ; Victoria Beach, Minaki.

— **inaequalis** (Cke.) Aderh. See Fusicladium.

— **Gaultheriae** E. & E. On living leaves of *Gaultheria procumbens* ; Minaki.

— **pulchella** Cke. & Pk. On leaves of *Chamaedaphne calyculata* ; Kenora.

Massariaceae

Massaria conspurcata (Wallr.) Sacc. On native Prunus ; M.A.C.

— **plumigera** E. & E. var. **tetraspora** Dearn. & House. On twigs of *Viburnum Opulus* ; M.A.C.

Massaria Pyri Otth. On *Amelanchier alnifolia* ; M.A.C.

— **vomitoria** B. & C. on Amelanchier ; M.A.C.

Massariella Curreyi (Tul.) Sacc. This fine species is common on Tilia branches at M.A.C. The Sphaeropsis stage, *S. olivacea* Otth. is also present.

Pleomassaria (n) **siparia** (B. & Br.) Sacc. On twigs of Amorpha ; M.A.C.

Gnomoniaceae

Gnomonia ulmea (Schw.) Thuem. Common on leaves of elm ; M.A.C.

Gnomoniella Coryli (Batsch) Sacc. Abundant on hazel leaves ; Berens River, Victoria Beach, M.A.C.

— **Coryli** var. **circinata** Dearness and Bisby, n. var. Differs from the usual form in the circination of the perithecia, the smaller spots, and the more strongly developed pseudostromata. On leaves of *Corylus rostrata* ; M.A.C., Winnipeg ; Aug. 8, 1926. *3243* (D. *65m*).

Valsaceae

Anthostoma adustum (C. & P.) Sacc. Dead twigs ; M.A.C.

Diaporthe albocarnis E. & E. Common on Cornus branches ; M.A.C.

— (n) **binoculata** (Ell.) Sacc. On Amelanchier ; M.A.C.

— **crassicolis** Nits. (*D. cornicola* E. & H.) On Cornus ; M.A.C.

— **eburensis** Sacc. On *Amorpha fruticosa* ; M.A.C.

— **stictostoma** (Ell.) E. & E. On Crataegus, and a form on Prunus in which the stroma reaches the wood but does not penetrate it ; M.A.C.

— **taleola** (Fr.) Sacc. On Quercus twigs ; M.A.C.

— (n) **tristicha** de Not. Old rose stems ; M.A.C.

Diaporthe Viburni Dearness and Bisby, n. sp. Stromata cortical, thickly scattered, one or two sometimes even three in a mm., marked by clusters of 2 or 3, seldom 4 or 5, shining black, cylindrical ostiola, erumpent, level with or rising at most hardly 100 μ above the encincturing cuticle, reaching the wood but not impressing it, coming off with the loosened bark, 0·5 mm. across the base, 0·2–0·3 mm. high, not circumscribed by a dark line nor darkening the underlying wood. Perithecia 2–5 in a stroma, broadly elliptic in section, 250 μ wide, 150 μ high ; ostiola emerging in a closely set group. Asci sessile, long-fusoid, 48–68 × 10–14 μ ; paraphyses not seen. Spores 2-ranked, 3-ranked in the middle of the ascus, hyaline, 1-septate, septum distinct, rounded at the ends, widest in the middle, not constricted, 15–18 × 4·5–6 μ; wall evident, 0·5–0·7 μ thick. On *Viburnum Lentago*; M.A.C., Winnipeg; April 18, 1926. *2697a* (D. *6048*).

Diaporthe viburnicola Wehmeyer *in litt.* On *Viburnum Opulus*; M.A.C. This species lacks the black limiting line of *D. Beckhausii* Nits. on the same host. Spores 15 × 3–4 μ.

Eutypa Acharii Tul. On old poplar and willow; M.A.C.

— **flavovirescens** (Hoff.) Sacc. (*Diatrype flavovirens* Fr.). On old barrel stave; M.A.C.

— **lata** (Pers.) Tul. On Salix and Populus; M.A.C.

— **ludibunda** Sacc. On Acer and Pyrus; M.A.C.

— **milliaria** (Fr.) Sacc. On *Viburnum Lentago*; M.A.C.

Eutypella angulosa Nits. On old wood; Kenora.

— **cerviculata** (Fr.) Sacc. On old wood; Kenora.

— (n) **Vitis** (Schw.) Cke. On Fraxinus; M.A.C.

Fenestella amorpha E. & E. On oak; M.A.C.

— **phaeospora** Sacc. Common on Populus, occasionally on Acer; M.A.C. The perithecia are sometimes single and might then be mistaken for a Karstenula.

— **princeps** Tul. On oak and Tilia; M.A.C.

— (n) **vestita** (Fr.) Sacc. On poplar; M.A.C.

Thyridium ambleium (C. & E.) Sacc. On elm, with a Microdiplodia; M.A.C.

— (n) **antiquum** (E. & E.) Sacc. On Prunus and Ribes; M.A.C.

— **canadense** E. & E. On old Crataegus; M.A.C.

Valsa ambiens (Pers.) Fr. Common on Alnus, Celastrus, Cornus, Corylus, Cotoneaster, Crataegus, Prunus, Pyrus, Quercus, Rosa, Salix, Tamarix, Ulmus, Viburnum; M.A.C., Victoria Beach, Brandon. Numerous host "forms" of this fungus have been named, but these names mean little. Asci commonly 8-spored but often with only 4 large spores.

— **boreela** Karst. On Salix branches; M.A.C.

— **cincta** Fr. On Prunus; M.A.C.

— **cornina** Pk. On *Cornus stolonifera*; M.A.C. 14–17 × 3–3·5 μ. An associated Cytospora has spores about 6 × 2 μ.

— **coronata** (Hoff.) Fr. On Cornus; M.A.C. 6–8 × 1–1·5 μ.

— **fraxinina** Pk. On ash; M.A.C. Considered by Ellis & Everhart (p. 481) as a large-spored form of *V. grisea*. Our specimens had spores 14–20 × 3–5 μ. The accompanying Cytospora had spores 4–6 × 1 μ.

— **leucostoma** (Pers.) Nits. Common on Amelanchier, Cotoneaster, Crataegus; M.A.C. An associated Cytospora with reddish beads had spores 4–7 × 2 μ.

Valsa leucostomoides Pk. The spores smaller than in type, 10–12 × 2 µ. On Corylus ; M.A.C.

— **nivea** (Hoff.) Fr. Common on bark of poplars ; M.A.C., Victoria Beach.

— **pallida** E. & E. On Salix (cult.) ; M.A.C. An associated Cytospora has spores 5–7 × 1·5 µ.

— **salicina** (Pers.) Fr. On willow branches ; M.A.C.

— **Symphoricarpi** Rehm ; M.A.C. Externally different from *V. ambiens* but similar internally.

— **translucens** de Not. On bark of Salix and Populus ; M.A.C.

Valsella Laschii Nits. On *Prunus Besseyi*, conidia also present ; M.A.C. (See *Mycologia* 18 : 253).

Melanconidaceae

Cryptosphaeria fissicola (C. & E.) Sacc. Or a form of it on Amelanchier ; M.A.C.

— **populina** (Pers.) Sacc. On poplar branches ; M.A.C.

Cryptospora (Calospora) Kansensis E. & E. On Symphoricarpos ; M.A.C. 17–25 × 9–10 µ.

Cryptosporella Lentaginis Rehm. On Viburnum ; M.A.C.

Melanconis occulta Fckl. On poplar branch ; M.A.C.

Valsaria insitiva Ces. & de Not. On oak and poplar ; M.A.C.

— **moroides** (C. & P.) Sacc. On alder branches ; Norway House.

Diatrypaceae

Diatrype albopruinosa (Schw.) Cke. Common on Corylus ; occasional on Prunus ; M.A.C.

— **albopruinosa** var. **salicina** Rehm. On Salix ; M.A.C.

— (n) **asterostoma** B. & C. On Viburnum and Salix ; M.A.C. 7–9 × 3 µ.

Diatrype Celastri Dearness and Bisby, n. sp. Stromata scattered, sometimes several confluent, erumpent and encinctured by the epidermis or lifting it free from the cortex ; seated on the cortex and blackening it, but not blackening the wood ; flat-pulvinate or conical or sometimes wider in the upper half ; 1–4 mm. in diam., 1–2 mm. high, brownish on the surface, white within. Perithecia monostichous, 5–20 in a stroma, ovate, 0·75 mm. high with cylindrical necks 0·5 mm. long ; ostiola variable, sometimes nearly entire, often sulcate and pyramidal, not prominent. Asci long-stipitate, about 100 µ long, spore-bearing portion 40–45 × 6–8 µ, paraphyses abundant reaching a length of 170 µ. Spores sub-biseriate, allantoid, curved, yellow-brown, obtuse, 11–13 (9–15) × 2·5–3 µ. On dead stems of *Celastrus scandens* ; M.A.C., Winnipeg ;

April 17, 1927. *3724* (D. *6479*). Approaches *D. bullata* (Hoff.) Fr.

Diatrype hochelagae E. & E. Old elm and box-elder ; M.A.C.

— **stigma** (Hoff.) de Not. Exceedingly common on Amelanchier, Betula, Crataegus, Prunus, Pyrus, Rosa, Quercus, Salix. Two forms of this fungus are to be found (depending perhaps upon the nature of the cortex of the host) : one with stromatic outgrowths which push up the bark, found on oak, and also on apple ; the other on other hosts, lacking these outgrowths. Norway House, Victoria Beach, M.A.C.

— **tumida** E. & E. A form on Amorpha with somewhat smaller stromata than in the type. M.A.C.

Diatrypella decorata Nits. Common on birch ; Norway House, M.A.C., Indian Bay, Kenora.

— **discoidea** C. & P., a form on *Viburnum Opulus* ; M.A.C.

— **Frostii** Pk. On Corylus stems ; M.A.C.

— **irregularis** C. & E. Possibly a form of *D. verrucaeformis*. On Pyrus ; M.A.C.

— **missouriensis** E. & E. Common on Corylus ; M.A.C.

— **quercina** Pers. On Amelanchier and Crataegus ; M.A.C.

— **verrucaeformis** (Ehr.) Nits. On Prunus ; M.A.C.

Melogrammataceae

Botryosphaeria fuliginosa (M. & N.) E. & E. (as the name is used by Ellis). On Fraxinus, Prunus, and Vitis ; M.A.C. A Haplosporella stage on Prunus has spores 18–24 × 9–12μ.

Xylariaceae

Daldinia concentrica (Bolt.) Ces. & de Not. Common on old wood, especially after fire.

— **vernicosa** (Schw.) Ces. & de Not. Less common than preceding ; M.A.C., Norway House.

Hypoxylon commutatum Nits. Bark of poplar ; M.A.C., Kenora.

— **crustaceum** Nits. On decaying poplar wood ; M.A.C.

— **fuscopurpureum** (Schw.) Berk. On Tilia ; M.A.C.

— **fuscum** (Pers.) Fr. On hazel, birch, etc. ; Norway House, M.A.C., Kenora.

— **Morsei** B. & C. On poplar, willow, alder ; M.A.C., Valley River, Kenora. On Pyrus and Cotoneaster at M.A.C. there are outgrowths comparable to *Institale acariforme* Fr.

— **multiforme** Fr. Common on birch ; Norway House, Victoria Beach.

Hypoxylon pruinatum (Klots.) Cke. (*H. Holwayii* Ell.). Common as a parasite and saprophyte on poplars ; M.A.C.

— **rubiginosum** (Pers.) Fr. Common and conspicuous on old deciduous wood ; Winnipeg, M.A.C.

— **serpens** Fr. On a stump ; M.A.C.

Nummularia repanda (Fr.) Nits. Not uncommon on elm ; M.A.C.

Xylaria acuta Pk. At base of stumps and on old Salix ; Gimli.

— **cornu-damae** (Schw.) Berk. Common on old wood ; Minaki, Victoria Beach.

— **Hypoxylon** (L.) Grev. Old wood ; M.A.C.

LABOULBENIALES

Laboulbenia Gyrinidarum Thaxter. On elytra of *Gyrinus lugens* ; Winnipeg. Collected by J. B. Wallis, identified by H. J. Brodie.

BASIDIOMYCETES

Sporobolomyces albus W. F. Hanna, n. sp. A yeast-like organism producing colonies white at first then creamy-white and finally sordid-yellowish when grown on nutrient agar. Multiplication chiefly by budding. Vegetative cells uninucleate, elliptical, 2·7–10·8 × 2·2–5·4 μ, mean 9·2 × 4·9 μ. Short aerial sterigmata are developed from cells at the surface of the colony, each bearing at its tip a uninucleate spore which at maturity is violently discharged into the air. Spores 4·3–6 × 4·3–4·8 μ, mean 5·5 × 4·5 μ.

Obtained repeatedly from rusted wheat and oat straw. The original cultures were secured from straw collected at M.A.C. in October 1928 and dried, then moistened in November and placed in a damp chamber over agar at the Dominion Rust Research Laboratory at Winnipeg. Spores were discharged from the straw and fell upon the medium, from which pure cultures were obtained. Subcultures have been sent to the Centralbureau at Baarn, Holland, and to the American Type Culture Collection at Chicago.

— **roseus** Kluyver & van Niel. Colonies pink in culture. Cells 10·8–13·5 μ long by 4·3–5·4 μ wide. Spores violently discharged from sterigmata, mean size 10 × 5 μ. Obtained, as was *S. albus*, from rusted wheat and oat straw in a damp-chamber by Dr. Hanna at the Rust Research Laboratory.

USTILAGINALES

Cintractia Caricis (Pers.) Magn. On *C. varia* at Victoria Beach, common on *C. aquatilis* at Norway House.

Doassansia Alismatis (Nees.) Cornu. On *Alisma subcordatum*; Dauphin, Poplar Point, M.A.C.

— **deformans** Setch. On Sagittaria; Victoria Beach, M.A.C.

— (n) **furva** Davis. On Sagittaria; M.A.C.

— **intermedia** Setch. On Sagittaria; Victoria Beach.

— **ranunculina** Davis. On *Ranunculus delphinifolius*; Birds Hill. This smut is apparently rare.

Entyloma Achilleae P. Magn. On *A. millefolia*, M.A.C., Aug. 5, 1928; and apparently also at Minaki and Norway House. The first known American record. Conidia 13–20 × 3–4 μ.

— **australe** Speg. On Physalis and Solanum; Melbourne, Birtle, Virden.

— **compositarum** Farl. On Aster, Ambrosia, Agoseris; Morris, Reston; I. L. Conners and W. L. Gordon.

— **Menispermi** Farl. & Trel. Common on *M. canadense*; M.A.C.

— **polysporum** (Pk.) Farl. On Gaillardia; M.A.C.

— **Ranunculi** (Bon.) Schr. On *R. Macounii*; Berens River, Victoria Beach.

— **Thalictri** Schroet. On *T. dioicum*; Reston, Dauphin, M.A.C.

Sorosporium Panici-miliacei (Pers.) Taka. Sometimes injurious; M.A.C., Keyes.

Sphacelotheca occidentalis (Seym.) Clint. On Andropogon; Binscarth, Onah.

— **Sorghi** (Link) Clint. On *Holcus Sorghum*; M.A.C.

Tilletia laevis Kuehn. Not uncommon on *Triticum aestivum*.

— **Tritici** (Bjerk.) Wint. Widespread and injurious on durums wherever grown and also on bread-wheats in the northern areas of Manitoba (I. L. Conners). Occasionally results in destruction of threshing machines from spontaneous combustion of the oily spores. Seed treatment fairly common.

Tracya Lemnae (Setch.) Syd. On Spirodela; Winnipeg.

Urocystis Agropyri (Preuss) Schroet. Reported from Brandon.

— **Anemones** (Pers.) Wint. On Pulsatilla; Morden, Brandon.

— **Cepulae** Frost. Found on onion in 1922, 1924, and 1925 at Winnipeg.

— **occulta** (Wallr.) Rab. On rye; rare in Manitoba.

Ustilago anomala (J. Kunze) Wint. On anthers of Tiniaria; Minaki.

— **Avenae** (Pers.) Jens. Often injurious to oats.

Ustilago bromivora (Tul.) Fisch. (*fide* W. P. Fraser). Common on *Agropyron tenerum.*

— (n) **grandis** Fr. or *U. mirabilis* Sorokin may be the smut of which a little was found on Phragmites at Delta by V. W. Jackson.

— **Hordei** (Pers.) Kell. & Swingle. Often injurious to barley.

— **hypodytes** (Schl.) Fr. On Stipa ; Treesbank, Rapid City.

— **levis** (K. & S.) Magn. Common on oats.

— **Lorentziana** Thuem. On *Hordeum jubatum* everywhere, sometimes abundant.

— **neglecta** Niessl. Rare on *Chaetochloa glauca.*

— **nuda** (Jens.) K. & S. Common on barley in Manitoba.

— **striaeformis** (West.) Niessl. On Beckmannia ; M.A.C. ; I. L. Conners.

— **Tritici** (Pers.) Rostr. Causes considerable loss of wheat.

— **Zeae** (Beckm.) Unger. Wherever maize is grown.

UREDINALES (including records from Fraser and Conners, *Trans. Roy. Soc. Can.*, 19 : 279–308).

Aecidium Onobrychidis Burr. On Petalostemon ; Birds Hill, Treesbank.

— **polygalinum** Pk. On *P. Senega* ; Brandon.

Calyptospora columnaris (A. & S.) Kuehn. On Vaccinium ; Minaki, Victoria Beach.

Coloesporium Solidaginis (Schw.) Thuem. I on pine needles, Elk Island, Spearhill ; II, III, everywhere on Aster, Callistephus, Doellingeria, Solidago.

Cronartium Comandrae Pk. III on Comandra ; Sifton, Norway House, Victoria Beach ; I on pine branches ; Spearhill.

— **Comptoniae** Arth. III on Myrica. Overhanging pine branches bore old galls, probably stage I ; Kenora.

Earlea speciosa (Fr.) Arth. On roses ; often injurious ; Morden, Morris, M.A.C.

Gymnoconia interstitialis (Schl.) Lag. On Rubus ; Gilbert Plains to M.A.C.

Gymnosporangium clavariaeforme (Jacq.) DC. On Amelanchier ; Victoria Beach.

— **corniculans** Kern. I on Amelanchier, III on Sabina ; M.A.C. westward.

— **cornutum** (Pers.) Arth. I on Sorbus ; Minaki, Norway House.

— **germinale** (Schw.) Kern. III on Juniperus ; I on Crataegus ; Victoria Beach to Virden.

— **juvenescens** Kern. I on Amelanchier ; Victoria Beach, Brandon.

Melampsora Bigelowii Thuem. I (?) on Larix, Birds Hill; III on willow everywhere.

— **Humboldtiana** Speg. On *Salix cordata* (*N.A. Flora*, 7: 669).

— **Lini** (Schum.) Desm. On *Linum Lewisii*; Baldur, Russell; widespread and sometimes injurious to cultivated flax.

— **Medusae** Thuem. II, III, common on poplars; M.A.C. westward.

Melampsoridium Betulae (Schum.) Arth. On birch; Treesbank; E. Criddle.

Melampsorella elatina (A. & S.) Arth. On Cerastium; Brandon; W. P. Fraser.

Melampsoropsis abietina (A. & S.) Arth. On Ledum; Kenora.

— **ledicola** (Pk.) Arth. II, III, on Ledum; I on Picea; Norway House, Minaki.

— **Pyrolae** (DC.) Arth. On species of Pyrola; Victoria Beach, M.A.C., and west.

Nyssopsora clavellosa (Berk.) Arth. On Aralia; Norway House, Swan River to M.A.C. and Minaki.

Peridermium coloradense (Diet.) Arth. Causes large witches' brooms on spruce; Victoria Beach to Norway House and Brandon.

Phragmidium Andersoni Shear. On Potentilla; M.A.C.

— **disciflorum** (Tode) James. On cultivated rose; M.A.C.

— **imitans** Arth. On Rubus; Brandon, Treesbank.

— **Ivesiae** Syd. On Potentilla; Brandon, Virden.

— **montivagum** Arth. On Rosa; Morris west to Virden.

— **Potentillae** (Pers.) Karst. On Potentilla and Sibbaldiopsis everywhere.

— **Rosae-acicularis** Liro. On *Rosa acicularis*; Norway House.

Pileolaria Toxicodendri (B. & Rav.) Arth. Winnipeg to Brandon.

Polythelis suffusca (Holw.) Arth. On Pulsatilla; Treesbank to Virden.

— **Thalictri** (Chev.) Arth. On Thalictrum sp.; Winnipeg, M.A.C.

Puccinia Absinthii DC. On Artemisia; Kenora, M.A.C., Dauphin.

— **abundans** (Pk.) Jacks. On Symphoricarpos; M.A.C. to Russell.

— **amphigena** Diet. On Smilax and Calamovilfa; Birds Hill to Binscarth.

— **Andropogonis** Schw. I on Comandra and Pentstemon; II, III, on Schizachyrium; Birds Hill to Morden and Binscarth.

Puccinia Angelicae (Schum.) Fckl. On Zizia ; Killarney, Brandon.
— **angustata** Pk. I on Mentha ; II, III, on Scirpus ; Brandon, Minaki.
— **anomala** Rostr. On barley, first found in 1922, common 1927.
— **Antirrhini** D. & H. On snapdragon at Winnipeg in 1919, in the greenhouse at M.A.C. in March 1920 ; injurious since ; Winnipeg to Reston.
— **apocrypta** Ell. & Tracy. On Onosmodium ; Treesbank ; E. Criddle.
— **Asparagi** DC. Sometimes injurious ; Morden to Brandon and M.A.C.
— **Asteris** Duby. On wild asters ; Minaki, Beulah to Virden.
— **Asterum** (Schw.) Kern. I on Aster, Grindelia, Solidago ; II, III, on Carex ; common from Winnipeg westward.
— **Bardanae** Cda. On Arctium ; Winnipeg ; D. L. Bailey.
— **Caricis-Shepherdiae** Davis (*Aec. Allenii* Clint.). On Elaeagnus and Lepargyrea ; Stonewall, Brandon, Gilbert Plains. Identifications by W. P. Fraser.
— **calthaecola** Schroet. On Caltha ; Dauphin ; W. P. Fraser.
— **Cicutae** Lasch. On *C. maculata* ; Brandon ; W. P. Fraser.
— **Circaeae** Pers. On *C. alpina* ; Victoria Beach, Norway House.
— **Cirsii** Lasch. On Cirsium ; Brandon, Treesbank, Birtle.
— **Clematidis** (DC.) Lagh. I on Actaea, Anemone, Thalictrum; II, III, on Agropyron, Bromus, Elymus, Hordeum, Poa ; widespread.
— **Comandrae** Pk. On *C. livida* ; Norway House.
— **Convolvuli** (Pers.) Cast. On *C. sepium* ; Neepawa ; R. C. Russell.
— **coronata** Cda. (*P. Rhamni*). I on Elaeagnus, Lepargyrea, Rhamnus ; II, III, on Avena, Beckmannia, Bromus, Calamagrostis, Scolochloa ; widespread, often injurious to oats.
— **dispersa** E. & H. Common, but not serious, on rye.
— **Distichlidis** E. & E. I on Steironema ; II, III, on Spartina ; M.A.C. westward.
— **Eleocharidis** Arth. I on Eupatorium ; II, III, on Eleocharis (*N.A. Flora*, 7 : 347).
— **Ellisiana** Thuem. I on Viola ; II, III, on Andropogon ; Winnipeg and Treesbank.
— **eminens** Kern. On *Carex durifolia* (*N.A. Flora*, 7 : 355).
— **fraxinata** (Link) Arth. I on ash ; M.A.C.
— **gigantea** Karst. On Chamaenerion ; Norway House.

Puccinia graminis Pers. I on *Berberis vulgaris*; II, III, on Agropyron, Agrostis, Alopecurus, Avena, Beckmannia, Briza, Dactylis, Elymus, Festuca, Hordeum, Koeleria, Lagurus, Phalaris, Phleum, Secale, Sporobolus, Torresia, Triticum. See Host Index for species of hosts, Bibliography and Sections V and XII for general references to this destructive rust.

— **Grindeliae** Pk. On Lygodesmia; western Manitoba; W. P. Fraser, E. Criddle.

— **Grossulariae** (Schum.) Lagh. I on Grossularia and Ribes; Norway House and southward.

— **Haleniae** A. & H. On Gentiana; Minaki.

— **Helianthi-mollis** (Schw.) Jacks. On sunflowers; Norway House and southward.

— **hemisphaerica** (Pk.) E. & E. On Lactuca, common; Winnipeg westward.

— **Heucherae** (Schw.) Diet. On *Heuchera Richardsonii*, Mitella; Norway House, Gimli, Treesbank.

— **hieraciata** (Schw.) Jacks. I on Hieracium, Lactuca, Nabalus; II, III, on Carex; Swan River, M.A.C., Morris, Brandon, etc.

— **Hieracii** (Schum.) Mart. On *Hieracium scabriusculum* and dandelion; Treesbank, M.A.C., Gilbert Plains, Norway House.

— **Impatientis** (Schw.) Arth. I on *Impatiens biflora* at Swan River, Big Black River, Dauphin; II, III, on Hordeum, and cultured by W. P. Fraser on Elymus, at Brandon.

— **Liatridis** (E. & A.) Beth. I on Lacinaria at Birds Hill; III on Agrostis at Treesbank, E. Criddle.

— **Linkii** Klotz. On *Viburnum pauciflorum*; Norway House.

— **lysimachiata** (Link) Kern. I on Naumbergia; Norway House.

— **Magnusiana** Koern. On Phragmites; Dauphin; W. P. Fraser.

— **Majanthae** (Schum.) Arth. I on Iris, Unifolium, Vagnera; and II, III, on Phalaris; Victoria Beach, Swan River, M.A.C. to Brandon.

— **malvacearum** Bert. Reported from Winnipeg on hollyhock; one doubtful specimen on Malva.

— **marylandica** Lindr. On Sanicula; Winnipeg to Brandon.

— **Menthae** Pers. On *Mentha glabrior* and Monarda; Grand Beach to Swan River, and Waskada to M.A.C.

— **millefolii** Fckl. On Achillea; Carberry to Roblin; W. L. Gordon and W. F. Hagborg.

— **monoica** (Pk.) Arth. I on Arabis; II, III on Trisetum; Treesbank, Le Pas.

Puccinia montanensis Ell. On Agropyron and Elymus; Brandon and Dauphin; W. P. Fraser.

— **ornata** Arth. & Holw. On Rumex; Glenboro; W. Popp.

— **Peckii** (de T.) Kell. I on Meriolix and Oenothera; II, III, on Carex; M.A.C. to Treesbank and Brandon.

— **Physalidis** Pk. On Physalis; Treesbank; E. Criddle.

— **Pimpinellae** (Strauss) Mart. On Osmorrhiza; Winnipeg, M.A.C.

— **Poarum** Niels. On blue-grass; Norway House southward.

— **Polygoni-amphibii** Pers. On Bilderdykia, Persicaria, and Polygonum; Victoria Beach to Swan River, and M.A.C. to Virden.

— **porphyrogenita** Curt. On Cornus; Norway House, Victoria Beach.

— **punctata** Link. On Galium; Norway House, Treesbank.

— **Rhamni.** See *P. coronata.*

— **Ribis** DC. On Ribes; Victoria Beach; W. L. Gordon.

— **rubefaciens** Johans. On Galium; Norway House, Assissippi, Killarney.

— **rubella** (Pers.) Arth. I on Rumex; II, III, on Phragmites; Dauphin, Treesbank; W. P. Fraser, E. Criddle.

— **Sherardiana** Koern. On Malvastrum; western Manitoba.

— **Sorghi** Schw. On maize; M.A.C. to Brandon. Not injurious.

— **Stipae** (Opiz.) Arth. On Stipa; western Manitoba; W. P. Fraser.

— **subnitens** Diet. III on Distichlis; western boundary.

— **substerilis** E. & E. On Stipa; Winnipeg and west.

— **triticina** Eriks. Common, sometimes injurious; on wheat.

— **troglodytes** Lindr. On Galium; M.A.C.

— **universalis** Arth. I on Artemisia; II, III, on Carex; Brandon, Treesbank, Ste. Rose.

— **urticata** (Link) Kern. I on Urtica; II, III, on Carex; everywhere.

— **vexans** Farl. On Bouteloua; Treesbank; E. Criddle.

— **Violae** (Schum.) DC. On Viola; Minaki, Victoria Beach, M.A.C. west.

— **Xanthii** Schw. On Ambrosia and Xanthium; Winnipeg, Morris, Treesbank.

Pucciniastrum Abieti-Chamaenerii Kleb. On Chamaenerion; Norway House, Kenora, Treesbank.

— **Agrimoniae** (Diet.) Tranz. On *A. gryposepala*; Kenora, Victoria Beach, Treesbank.

— **arcticum** (Lagh.) Tranz. On Rubus; Norway House, Kenora, M.A.C. and west.

Pucciniastrum Epilobii Otth. On *E. adenocaulon* and Godetia; Norway House, Victoria Beach, M.A.C., Brandon.

— **Pyrolae** (Pers.) Diet. On Pyrola; M.A.C., Treesbank.

Rostrupia tomipara (Trel.) Lagh. A segregate of *Puccinia coronata* with teliospores several-celled; on Bromus; Brandon, Morris, Neepawa; W. P. Fraser.

Uredinopsis mirabilis (Pk.) Mag. (*Peridermium balsameum*). On Abies; Minaki.

— **Struthiopteridis** Stoerm. On Pteretis; common at M.A.C.

Uromyces acuminatus Arth. On Spartina; Brandon; W. P. Fraser.

— **Alopecuri** Seym. I on Ranunculus, Eden, Kelwood, Brandon; and II, III, on Alopecurus at Brandon, W. P. Fraser.

— **caryophyllinus** (Schr.) Wint. On carnation; Brandon.

— **Fabae** (Pers.) de Bary. On Lathyrus, Pisum, Vicia; Swan River to M.A.C. and Treesbank.

— **flectens** Lagh. (*U. nerviphila* (Grognot) Hotson). I, III, on Trifolium; M.A.C.; determined by E. B. Mains.

— **Glycyrrhizae** (Rabh.) Magn. On *G. lepidota*; M.A.C. to Swan River.

— **Hedysari-obscuri** (DC.) C. & P. On *H. boreale*; Binscarth, Rapid City.

— **hybridi** Davis. On alsike clover; M.A.C. to Kenville.

— **Junci** (Desm.) Tul. I on Cirsium and Helianthus, Brandon, Virden; II, III, on Juncus; Oak Lake to Treesbank; W. P. Fraser.

— **perigynius** Halst. I on Rudbeckia; Dauphin, Dropmore.

— **Polygoni** (Pers.) Fckl. On *P. erectum, P. aviculare*; M.A.C., Morris, Dauphin.

— **porosus** (Pk.) Jacks. On Vicia; Winnipeg, M.A.C.

— **proeminens** (DC.) Lév. On Chamaesyce; M.A.C., Morden.

— **punctatus** Schroet. On Oxytropis; Birtle.

— **Rudbeckiae** Arth. & Holw. On *R. laciniata*; Dauphin.

— **Scirpi** (Cast.) Burr. On *S. validus*; Poplar Point.

— **Trifolii** (Hed. f.) Lév. On red and zigzag clovers; M.A.C., Chater.

— **Trifolii-repentis** (Cast.) Liro. On white clover; M.A.C.

Uropyxis Amorphae (Curt.). Common on Amorpha spp., sometimes injurious to *A. fruticosa* used as a hedge; M.A.C., Morden, Portage, etc.

AURICULARIALES

Auricularia Auricula-Judae Fr. Victoria Beach, Kenora.

TREMELLALES

Eichleriella spinulosa (B. & C.) Burt. This rare fungus was found on poplar at Swan River; July.

Exidia (n) **alba** (Lloyd) Burt. On old wood ; Winnipeg, Kenora.

— **glandulosa** (Bull.) Fr. " Witches' butter " is found on branches everywhere.

— **viscosa** (Berk.) Rea. On poplar bark ; M.A.C. 10–14 × 4–6.

Naematelia nucleata (Schw.) Fr. On dead wood ; M.A.C. Exidia of Burt.

Sebacina calcea (Pers.) Bres. On old wood ; Kenora.

Tremella lutescens Pers. On wood ; Norway House, M.A.C.

— **mesenterica** Fr. On dead wood ; Norway House.

— **mycetophila** Pk. M.A.C. Now considered part of *Collybia dryophila.*

— **reticulata** (B. & C.) Farl. (including *T. clavarioides* Lloyd). On the ground in woods ; M.A.C.

Tremellodon gelatinosum (Scop.) Fr. Old conifers ; Victoria Beach, Minaki, Kenora.

Ulocolla foliacea (Pers.) Bref. (Exidia). Coniferous bark ; Kenora.

DACRYOMYCETALES

Dacryomyces aurantius (Schw.) Farl. Common everywhere on railway ties and other coniferous wood.

— **deliquescens** (Bull.) Duby. On coniferous wood ; M.A.C., Kenora.

— (n) **minor** Pk. On poplar log ; M.A.C.

— **palmatus** (Schw.) Burt. Occasionally occurs.

— **stillatus** Fr. (*D. abietinus* (Pers.) Schroet). On pine wood ; Ingolf.

Guepinia elegans B. & C. On fallen *Acer Negundo* ; M.A.C.

— **spathularia** (Schw.) Fr. Reported from Kenora.

EXOBASIDIALES

Exobasidium Vaccinii (Fckl.) Wor. On leaves of blueberry, bearberry, Azalea ; Victoria Beach, Camp Hughes, Winnipeg.

AGARICALES

Thelephoraceae

Aleurodiscus amorphus (Pers.) Reb. On bark ; Kenora, M.A.C.

— **candidus** (Schw.) Burt. On old railway ties ; M.A.C.

— **cerussatus** (Bres.) v. H. & L. Dr. Burt wrote (May 4, 1921) that these were the first American specimens he had seen. On old wood ; M.A.C., Sept. 2 and Oct. 16, 1920.

Coniophora byssoidea (Pers.) Fr. On branches ; Arborg, Victoria Beach.

Coniophora cerebella Pers. On old wood ; Kenora, Manitou.
— **suffocata** (Pk.) Massee. On wood ; Winnipeg, M.A.C.
Corticium albido-carneum (Schw.) Massee. On wood ; M.A.C.
— **arachnoideum** B. & C. On poplar, etc. ; Norway House, M.A.C.
— **centrifugum** (Lév.) Bres. Deciduous wood ; M.A.C., Stony Mountain.
— **confluens** Fr. On old wood ; M.A.C.
— (n) **effuscum** Cke. & Ellis. On fallen log ; M.A.C.
— **galactinum** (Fr.) Burt. On dead poplar, etc. ; M.A.C.
— **livido-caeruleum** Karst. On coniferous wood ; Norway House.
— **luridum** Bres. On wood ; Winnipeg.
— **polygonium** Pers. On poplar bark ; M.A.C.
— **radiosum** Fr. On coniferous wood, Victoria Beach ; the same or similar species on poplar, M.A.C.
— **roseum** Pers. On wood ; Stony Mountain, Winnipeg, M.A.C.
— **rubellum** Burt. (*Ann. Mo. Bot. Gard.*, 13 : 232). On bark ; Kildonan Park, Winnipeg.
— **septentrionale** Burt. (*loc. cit.*, p. 257). Type collected at M.A.C., Oct. 19, 1922.
— **sociatum** Burt. (*loc. cit.*, p. 192). On coniferous wood ; Norway House.
— **vagum** B. & C. On wood, Norway House ; on potato stems, M.A.C.
— **vellereum** E. & C. On deciduous wood ; Winnipeg, M.A.C.
— **vesiculosum** Burt. On old wood ; Sifton.
Craterellus Cantharellus (Schw.) Fr. Among conifers ; Ingolf, Victoria Beach.
— **clavatus** (Pers.) Fr. In coniferous woods ; Victoria Beach.
Cyphella capula (Holmsk.) Fr. On fern frond ; M.A.C.
— **fasciculata** (Schw.) B. & C. On dead wood ; M.A.C., Victoria Beach.
— **minutissima** Burt. On inner bark of poplar ; M.A.C., Victoria Beach.
— **Tiliae** (Pk.) Cke. Very common on branches of *Tilia americana* ; Winnipeg, M.A.C.
— (n) **villosa** (Pers.) Karst. On poplar branch ; M.A.C.
Cytidia salicina (Fr.) Burt. (*Corticium salicinum* Fr.). Common on Salix ; M.A.C., Kenora.
Hymenochaete badio-ferruginea (Mont.) Lév. On fallen branches of deciduous trees ; Victoria Beach, Minaki, Indian Bay.

Hymenochaete cinnamomea (Pers.) Bres. On dead wood; Winnipeg, M.A.C.

— **Curtisii** (Berk.) Morg. On oak; Winnipeg, M.A.C.

— **rubiginosa** (Dicks.) Lév. On bark; Winnipeg.

— **tabacina** (Sow.) Lév. Common at Kenora, and doubtless elsewhere.

Hypochnus canadensis Burt. (near the European *H. ferruginosus*). On dead wood; M.A.C.

— **cervinus** Burt. This fungus, recorded by Burt. (*loc. cit.*, 3 : 232) from Washington only, was collected at Norway House and determined, as were the majority of this family, by him.

— **chalybaeus** (Pers.) Bres. On dead wood; M.A.C.

— **coriarius** (Pk.) Burt. On decayed wood; M.A.C.

— **echinosporus** (Ell.) Burt. Assiniboine Park; Winnipeg.

— **ferrugineus** (Pers.) Fr. On old poplar; M.A.C.

Hypochnus flavo-brunneus Dearness and Bisby, n. sp. Broadly effused, thin, 60–300 μ, separable when moistened, whitish or creamy on margin, then sulphur-yellow to colonial-buff, becoming wood-brown or darker as the spores develop. Margin byssoid; some rope-like strands 15–30 μ thick near the substratum; hyphae somewhat incrusted, about 4 μ thick, lateral branches in the submarginal portions terminating in subglobose or spore-like knobs, 5–7 μ across. Cystidia 7 μ thick, not incrusted, cylindrical, rounded on the ends, projecting up to 15–25 μ beyond the basidia. Spores dark-amber-coloured under the microscope, broadly elliptic, finely echinulate, 7–9·5 (11) × 6–7 μ.

Type fructification 10 × 4·5 cm. on a firm, coniferous board. Winnipeg, Oct. 13, 1927. G. R. Bisby, *3772* (D. *6826*). Found several times. A fine species of which we failed to find a published description.

— **fumosus** Fr. On dead wood; Norway House, M.A.C.

— **granulosus** (Pk.) Burt. On bark; Kenora.

— **pannosus** (B. & C.) Burt. On rotten wood; M.A.C.

— **spongiosus** (Schw.) Burt. On old wood; Victoria Beach, M.A.C.

— **umbrinus** (Fr.) Burt. On frondose wood; M.A.C.

Peniophora aurantiaca Bres. On alder twigs; Norway House, Kenora.

— **candida** (Pers.) Lyman. On old wood; M.A.C.

— **cinerea** (Pers.) Cke. Common on wood; Kenora, M.A.C.

— **crassa** Burt. Old wood; M.A.C.

— **cremea** Bres. On frondose wood; M.A.C., Swan River.

Peniophora gigantea (Fr.) Massee. On old wood ; M.A.C.
— **glebulosa** Bres. On coniferous wood ; Norway House.
— **incarnata** (Pers.) Karst. On ash, etc. ; St. Norbert, M.A.C.
— **odontioides** Burt. (Burt, *loc. cit.*, 12 : 223). On decaying frondose wood. Type collected at Swan River.
— **pubera** (Fr.) Sacc. On old wood ; M.A.C.
— **setigera** (Fr.) Bres. On bark ; Kenora.
— **subcremea** v. H. & L. Rare. Recorded by Burt (*loc. cit.*, 12 : 304) from Finland, Montana, and Manitoba. Frondose wood ; M.A.C.
— **subsulphurea** (Karst.) v. H. & L. On conifer ; Norway House.
Solenia anomala (Pers.) Fckl. Common on wood ; Norway House, M.A.C., Kenora.
— **fasciculata** Pers. On old wood ; Winnipeg ; determined by G. F. Atkinson.
Stereum cinerascens (Schw.) Massee. On wood ; common along the Red River.
— **fasciatum** Schw. On dead wood ; Norway House, Winnipeg, M.A.C.
— **frustulosum** (Pers.) Fr. On wood, not common.
— **fuscum** (Schrad.) Quel. (*S. bicolor*). Common ; Kenora, M.A.C., Victoria Beach, etc.
— **gausapatum** Fr. Common at Winnipeg and M.A.C.
— **hirsutum** (Willd.) Fr. On frondose wood ; Kenora, M.A.C.
— **ochraceo-flavum** Schw. Norway House ; determined by C. H. Kauffman.
— **purpureum** Pers. Common about Winnipeg as a saprophyte on old poplars etc. Sometimes injurious at M.A.C. and Morden on plum and apple, causing " Silver leaf."
— **radiatum** Pk. On old wood ; Kenora.
— **rufum** Fr. Abundant on poplar branches at all localities visited. Collected once at M.A.C. on Salix.
— **rugosiusculum** B. & C. Kenora, Norway House.
— **versiforme** B. & C. On birch and willow ; Roblin, Vista, Gimli, M.A.C.
Thelephora caespitulans Schw. Common on ground in woods ; M.A.C.
— **caryophyllea** (Schaeff.) Fr. In woods ; Norway House.
— **intybacea** (Pers.) Fr. In woods ; Norway House, M.A.C.
— **laciniata** Pers. Recorded from Minaki and M.A.C.
— **multipartita** Schw. On ground in woods ; M.A.C.
terrestris (Ehr.) Fr. Norway House, Victoria Beach, M.A.C.

Clavariaceae

Calocera cornea (Batsch) Fr. Common on old poplar, birch, etc.; M.A.C., Gimli, Black Island, Lake Winnipeg.

— **viscosa** (Pers.) Fr. Recorded from Kenora.

Clavaria abietina Pers. On ground, coniferous woods; Ingolf, Victoria Beach.

— **apiculata** Fr. On coniferous wood; Victoria Beach, Kenora.

— **cristata** (Holmsk.) Fr. Common in woods; M.A.C., Kenora.

— **cristata** f. **cinerea.** Common in deciduous woods; M.A.C.

— **decurrens** Pers. or a variety. In deciduous woods; M.A.C.

— **flava** Schaeff. In woods; Victoria Beach.

— **formosa** Pers. Recorded with doubt from Kenora.

— **fumosa** Pers. In woods, Kenora.

— **ligula** Schaeff. Common in coniferous woods; Norway House, Victoria Beach, Ingolf, Kenora.

— (n) **muscoides** L. On the ground; Victoria Beach.

— **Patouillardii** Bres. This species, recorded by Coker as "evidently rare," is one of the commonest clavarias at M.A.C. It occurs in deciduous woods of poplar, ash, box-elder, or oak, where it forms a conspicuous whitening of the leaf-mould.

— **pistillaris** (L.) Fr. In woods; Kenora, Ingolf.

— **pulchra** Pk. On bare soil; Norway House.

— **pyxidata** Pers. Fairly common on wood; Victoria Beach, M.A.C., Gimli, Ingolf.

— **stricta** Pers. On old deciduous wood; M.A.C., Victoria Beach, Norway House.

Pistillaria culmigena (Mont. & Fr.) Berk. On old grass leaves; M.A.C.

— **typhuloides** (Pk.) Burt. On old stems of *Chamaenerion angustifolium*; Norway House.

Pterula penicillata Berk. Whitemouth; F. G. Feller.

Typhula filiformis (Bull.) Fr. On old leaves; M.A.C.

— **gyrans** Fr. Sclerotia large; on old leaves; M.A.C.

— **placorrhiza** (Reich.) Fr. Growing from orange-brown sclerotia, sclerotia up to 6 × 3 mm. In old sawdust and soil; M.A.C. Spores 10–12 × 4–6 μ.

Hydnaceae

Grandinia corrugata Fr. On old wood; M.A.C.

Hydnum argutum Fr. (*Odontia arguta*). On poplar, etc.; M.A.C. *Cf. Hydnum Ellisianum* Banker.

— **auriscalpium** (L.) Fr. Occasionally found growing from buried cones; Victoria Beach, Kenora.

— **caeruleum** Fl. Dan. Under pines: Norway House.

Hydnum caryophylleum B. & C. Kildonan Park, Winnipeg.
— **coralloides** Scop. Not uncommon on wood; Gimli, Victoria Beach, Minaki, Winnipeg.
— **cyathiforme** Schaeff. (*H. connatum* Schulz). In coniferous woods; Ingolf, Norway House.
— (n) **farinaceum** Fr. On old wood; M.A.C.
— **fennicum** Karst. In coniferous woods; Victoria Beach, Ingolf. Similar to *H. imbricatum*, but with a bitter taste.
— **ferrugineum** Fr. Old wood; Ingolf.
— **ferrugipes** Coker. A beautiful Hydnum in coniferous woods; Victoria Beach.
— **fusco-atrum** Fr. On deciduous wood; Swan River, Winnipeg.
— **himantia** Schw. Found in Manitoba, exact locality not known.
— **imbricatum** Fr. In woods; Ingolf, Minaki.
— **Kauffmani** Pk. Winnipeg. See Lloyd: *Myc. Notes*, 67: 114.
— **laeticolor** B. & C. On old wood; Elk Island.
— **mirabile** Fr. Amongst conifers; Norway House.
— **niveum** Pers. Not uncommon on old wood; M.A.C.
— **ochraceum** Fr. On wood; Gimli, Victoria Beach, M.A.C.
— **plumosum** Duby. Not common at M.A.C.
— **repandum** Fr. On ground in coniferous woods; Norway House, Victoria Beach, Kenora.
— **septentrionale** Fr. Winnipeg; on birch at Victoria Beach.
— **velutinum** Fr. In woods; Ingolf; W. N. Denike.
Mucronella minutissima Pk. On bark; River Park, Winnipeg.
Odontia alutacea Fr. On wood; M.A.C.
— **Barbae-Jovis** (With.) Fr. On old wood; Minaki.
— **farinacea** (Pers.) Fr. On decaying wood; M.A.C.
— **fimbriata** Pers. On wood of poplar, etc.; M.A.C., Kenora.
— **glauca** Ell. & Lang. On deciduous wood; M.A.C.
Phlebia merismoides Fr. (*P. cinnabarina* Schw.). M.A.C., Kenora.
— **strigoso-zonata** (Schw.) Lloyd. Common on fallen poplars; M.A.C. to Minaki.
Radulum orbiculare Fr. Reported on elm at Winnipeg Beach by Cheesman (51).

Polyporaceae

In collaboration with Dr. L. O. Overholts.

Daedalea confragosa (Bolt.) Fr. Common on willow, etc.
— **unicolor** (Bull.) Fr. Abundant on deciduous wood everywhere.

Favolus canadensis Klotz. Throughout the areas visited.
Fomes applanatus (Pers.) Wallr. Common and widespread.
— **conchatus** (Pers.) Gill. On Viburnum ; M.A.C.
— **connatus** Weinm. On Acer ; Winnipeg, M.A.C.
— **fomentarius** (L.) Gill. On trees throughout our range.
— **igniarius** Fr. Often injurious to deciduous trees, especially poplars, and also on dead trunks.
— **igniarius** var. **nigricans** Fr. Common on trees and trunks.
— (**Trametes**) **Pini** (Thore) Lloyd var. **Abietis** Karst. Elk Island.
— **pinicola** (Swend.) Cke. Common on conifers ; Victoria Beach, Minaki.
— **pinicola.** A form on *Populus balsamifera* with whitish unvarnished pilei ; M.A.C., Victoria Beach.
— **pomaceus** (Pers.) Big. & Guill. (*F. fulvus* (Scop.) Bres.). On Prunus ; M.A.C., Melita.
— **Ribis** (Schum.) Gill. At the base of cultivated currant ; M.A.C.
— (**Trametes**) **scutellatus** (Schw.) Cke. On Amelanchier, Celastrus, Acer ; Kenora, M.A.C.
Lenzites abietina (Bull.) Fr. (or very thin *L. saepiaria*). Swan River.
— **betulina** Fr. On birch ; Gimli, Norway House, Kenora, etc.
— **saepiaria** Fr. On coniferous wood ; everywhere.
— **trabeus** (Pers.) Fr. (*L. vialis* Pk.). Chater, Winnipeg, M.A.C.
Merulius ambiguus Berk. On conifer ; Indian Bay ; I. L. Conners.
— **confluens** Schw. On old wood ; M.A.C.
— **corium** Fr. On wood ; Winnipeg.
— **lachrymans** (Wulf.) Fr. Not common ; caused $2,000 damage to flooring in a Winnipeg orphanage.
— **niveus** Fr. On alder, etc. ; Kenora, Norway House.
— **pilosus** Burt. Norway House. Dr. Burt referred two collections to this species, otherwise known to him only from the Pacific Coast, with the note that the hymenial configuration differs from that of the type, but the specimens agree in colour and microscopic structure.
— **tremellosus** (Schrad.) Fr. On birch, poplar ; widespread.
Polyporus abietinus (Dicks.) Fr. On coniferous wood ; Kenora, Swan River, M.A.C.
— **adustus** (Willd.) Fr. Very common ; Norway House southward.
— **albellus** Pk. On deciduous wood ; M.A.C.

Polyporus albiceps Pk. This rare species found twice at M.A.C.
— **albidus** (Schaeff.) Fr. Collected at Minaki and Victoria Beach.
— **alutaceus** Fr. (*P. guttulatus* Pk.). Minaki.
— **arcularius** (Batsch) Fr. On old wood in May; Gimli, Arborg, Victoria Beach, M.A.C.
— **anceps** Pk. A rare species; on old wood; Ingolf, Kenora.
— **betulinus** Bull. On birch everywhere; obtained once on alder at Arborg. Spore-discharge interrupted by winter.
— **biformis** Klotz. On wood; Norway House, Winnipeg.
— **brumalis** (Pers.) Fr. On wood; Kenora, Minaki, M.A.C.
— **caesius** (Schrad.) Fr. On dead wood; Norway House.
— **chioneus** Fr. On old poplar, etc.; M.A.C., Victoria Beach.
— **cinnabarinus** (Jacq.) Fr. Gimli, Victoria Beach, Minaki, M.A.C.
— **circinatus** Fr. Growing from buried wood; Victoria Beach.
— **conchifer** (Schw.) Fr. Occasional on elm, etc.; Winnipeg.
— **cuticularis** Bull. Collected once at Victoria Beach.
— **dichrous** Fr. Common on deciduous wood about Winnipeg and elsewhere.
— **elegans** (Bull.) Fr. Common; M.A.C., Victoria Beach, Swan River.
— **fibrillosus** Karst. On conifer bark; Victoria Beach.
— **floriformis** Quel. On poplar poles in a cellar; M.A.C.
— **fumosus** (Pers.) Fr. On old wood; M.A.C.
— **gilvus** Fr. Not common; on Salix, Acer; M.A.C.
— **glomeratus** Pk. This interesting species was found twice on old poplar; M.A.C.
— **hirsutus** Fr. Common on deciduous wood.
— **osseus** Kalchbr. Found at Kenora and Victoria Beach.
— **ovinus** Fr. This fine species is not rare on the ground in coniferous woods at Victoria Beach, Minaki, and Kenora. "It is doubtful that it occurs in the United States," C. G. Lloyd.
— **pargamenus** Fr. Common everywhere. Often bears the lichen *Calicium polyporaeum.*
— **peckianus** Cke. Locality uncertain, perhaps Winnipeg.
— **perennis** (L.) Fr. Common in sandy soil under conifers; Kenora, Victoria Beach, etc.
— **picipes** Fr. Common and widespread on stumps and logs.
— **planellus** Murr. Not uncommon on old wood; M.A.C., St. Norbert.
— **pubescens** (Schum.) Fr. Occurs throughout our range.
— **resinosus** (Schrad.) Fr. On old log and tree-trunk; M.A.C.

Polyporus Schweinitzii Fr. Found on two occasions at Minaki.
— **semipileatus** Pk. On dead wood ; M.A.C.
— **spumeus** (Sow.) Fr. Found once at Winnipeg.
— **squamosus** Pers. Is rare, seen but twice ; Winnipeg, and M.A.C.
— **subchartaceus** Murr. (a form of *P. pargamenus*). Occurs on poplars ; M.A.C.
— **sulphureus** (Bull.) Fr. Is rare, reported twice.
— **tomentosus** Fr. Occasional at Minaki.
— **tuberaster** Fr. (probably). Described by Güssow as *Grifola Tuckahoe.* The large black sclerotia, sometimes 6 inches or more in diameter, are common in the soil (especially lighter soil ; not yet found along the Red River), often attached to roots. The pilei have not been noted by us in the woods, but Mr. S. Criddle, Treesbank, developed two large fruit-bodies from a sclerotium planted in the sand.
— **tulipiferus** (Schw.) Overh. (*Irpex lacteus*). Everywhere.
— **umbellatus** (Pers.) Fr. Winnipeg Beach ; found to be edible.
— **ursinus** Lloyd. This rare species found once at Winnipeg.
— **varius** Fr. Approaching *P. melanopus* ; not uncommon at M.A.C. growing from buried sticks.
— **velutinus** Fr. This species, also called *P. zonatus* Fr., is common on poplars, etc. ; M.A.C., Victoria Beach, Kenora.
— **versicolor** (L.) Fr. Common on plum, apple, oak.
— **volvatus** Pk. Occurs on spruce at Swan River, Ethelbert, and probably elsewhere in the west of Manitoba, but we have been unable to find it around, or east of, Lake Winnipeg.
— sp. Swan River, Man. An apparently undescribed species obtained from just north of 52°. Evidently the northern Polypori of North America are nearly all known, for extensive collecting in this hitherto unexplored region has resulted in finding but this one collection that could not be referred to existing species. Dr. Overholts will probably describe it.
Poria ambigua Bres. On old poplar wood ; M.A.C.
— **attenuata** Pk. Common on fallen poplar logs ; M.A.C.
— **borealis** Overholts *in litt.* On poplar bark ; M.A.C.
— **calcea** Fr. On a burnt log ; Swan River.
— **candidissima** (Schw.) Cke. Swan River, M.A.C. (*Mycologia*, 15 : 208).
— **corticola** (Fr.) Cke. Common ; Winnipeg, M.A.C., Swan River.

Poria ferruginosa (Schrad.) Fr. On deciduous wood ; M.A.C., St. Norbert.

— **laminata** Murr. Common on old poplar, willow ; M.A.C.

— (n) **ornata** Pk. On deciduous wood ; M.A.C.

— **prunicola** Murr. On dead branch of Prunus ; M.A.C.

— **purpurea** (Fr.) Cke. On poplar, etc. ; Winnipeg, M.A.C.

— **selecta** Karst. Common and evidently destructive to timbers ; M.A.C., Victoria Beach, Indian Bay, Boissevain, Pte. du Bois.

— **semitincta** Pk. On poplar ; M.A.C.

— **Vaillantii** Fr. Apparently rotting timbers ; Winnipeg, M.A.C.

— **viticola** (Schw.) Cke. On willow branch ; M.A.C.

— **washingtoniensis** Murr. M.A.C.

Trametes hispida Fr. Is common throughout Manitoba.

— **odorata** (Wulf) Fr. (probably the poroid form of *Lenzites saepiaria*). Common ; Winnipeg, M.A.C., Kenora.

— **Peckii** Kalch. (form of *T. hispida*). Winnipeg ; probably common.

— **serialis** Fr. On bark of conifer ; Victoria Beach.

— **subrosea** Weir (*T. carnea*). Common on conifers, railway ties, etc. ; everywhere.

— **Trogii** Berk. (a form of *T. hispida*). Gimli.

Boletaceae

Boletinus cavipes (Opat.) Kalch. Minaki.

— **pictus** Pk. Among conifers ; Birds Hill, Kenora.

Boletus (n) **brevipes** Pk. In woods ; Minaki.

— **Clintonianus** Pk. In low woods ; Birds Hill.

— **edulis** (Bull.) Fr. In sandy coniferous woods ; Victoria Beach.

— **flavus** Wither. Recorded from Kenora and Winnipeg.

— **granulatus** (L.) Fr. Common among conifers ; Victoria Beach, Ingolf.

— **luteus** (L.) Fr. Woods ; Ingolf ; W. N. Denike.

— **rubinellus** Pk. Pilei 3–6 cm. wide, yellowish to reddish-brown, stem yellowish at base and within, pores yellow with orange mouths, spores 8–10 × 3–4 μ, cystidia abundant especially near mouths, 40–50 × 9–10 μ, brownish. Leaf-mould in poplar woods ; M.A.C.

— **scaber** (Bull.) Fr. Common in midsummer in woods ; everywhere.

— **sphaerosporus** Pk. Deciduous woods ; M.A.C. First found in 1926 ; fairly common in 1927.

— **subaureus** Pk. Victoria Beach, Kenora.

Boletus (n) **subglabripes** Pk. Among pines; Victoria Beach, Ingolf.

— **versipellis** Fr. Possibly only a form of *B. scaber*. Common.

Agaricaceae

(1) Leucosporae

Amanita bisporiger Atk. On sand under *Pinus Banksiana*; Victoria Beach; Sept. Not common.

— **porphyria** Fr. In low woods; Kenora and Ingolf; Aug.–Sept.

— **muscaria** Fr. Widely distributed in Manitoba. At M.A.C. it usually first appears in early August, and it may continue through September; often common in open woods in August. Our plants are orange-yellow, not scarlet as in European collections (see p. 48).

— **phalloides** Fr. Occasionally found; Victoria Beach, Minaki; Sept.

— **russuloides** Pk. Yellowish pilei with long striae, in open woods; M.A.C.; August.

— **solitaria** Fr. Kenora; Sept.

— **verna** Fr. Minaki. Pileus with striae above the even margin; Sept.

— (n) **virosa** Fr. Minaki; Sept.

Amanitopsis fulva (Schaeff.) W. G. Sm. Fairly common.

— **vaginata** Fr. var. **alba** Sacc. Common at M.A.C. and elsewhere during the summer.

— **vaginata** Fr. var. **livida** Pk. Coniferous areas.

— **strangulata** Fr. Kenora, M.A.C.; July–Oct.

Armillaria caligata Fr. Occasional in coniferous areas; Aug.–Sept.

— (n) **focalis** Fr. Victoria Beach; Sept.

— **mellea** Fr. Abundant in all its disguises, and often injurious to living trees. Exposed mycelium phosphorescent until it becomes protected by a thin blocking layer, which appears as a black line in a cleft stump. The cause of "fox-fire," known to woodsmen and others.

Cantharellus aurantiacus Fr. Coniferous woods; Norway House southward; Aug.–Oct.

— **cibarius** Fr. Coniferous woods; very abundant at Victoria Beach in 1928; Aug.–Sept.

— (n) **cinnabarinus** Schw. Victoria Beach; Aug.

— **infundibuliformis** Fr. In a swamp; Kenora.

— **tubaeformis** Fr. In frondose woods; Victoria Beach, M.A.C.; Sept.–Oct.

Cantharellus umbonatus Fr. Common in coniferous woods as far north as Norway House. Often found on mossy rocks; July–Oct.

Clitocybe adirondackensis Pk. M.A.C. woods; Aug.–Sept.

— **albidula** Pk. M.A.C.; Aug.–Sept.

— **albissima** Pk. M.A.C.; July. Spores echinulate in this species.

— **biformis** Pk. M.A.C.; July.

— (n) **candicans** Fr. M.A.C.; August.

— **cartilaginea** (Bull.) Bres. Victoria Beach; Sept.

— **catina** Fr. Victoria Beach; Sept.

— (n) **dealbata** Fr. Ingolf; Aug.

— **decora** Fr. Gimli; Sept.; T. Johnson.

— **ectypoides** Pk. Victoria Beach; July–Aug.

— **farinacea** Murr. A Clitocybe which fits this description occurs in autumn on old sawdust in an ice-house at M.A.C.

— (n) **fragrans** Fr.-Ricken. M.A.C.; August.

— **gigantea** Fr. Minaki and Kenora; Sept.–Oct.

— **infundibuliformis** Fr. M.A.C.; July–Aug.

— **maxima** Fr. Victoria Beach, Gimli; Sept.–Oct.

— **morbifera** Pk. On lawns, occasional; Winnipeg, M.A.C.

— **multiceps** Pk. Common for several years on lawn; M.A.C., Ingolf. Cespitose and pilei often deformed by crowding.

— **odora** Fr. Common; M.A.C., Victoria Beach. Whitish to greenish.

— **odora** var. **anisaria** Pk. M.A.C.

— **praecox** Kauff. Among grass in sandy soil; Victoria Beach; June.

— **pulcherrima** Pk. On old wood, Victoria Beach; Aug.

— **truncicola** (Pk.) Sacc. On old deciduous logs; M.A.C., Kildonan Park; Aug.–Sept.

Collybia (n) **acervata** Fr. On ground in woods; Victoria Beach, M.A.C.

— (n) **aquosa** Fr. M.A.C.; June.

— **atratoides** Pk. On old wood; M.A.C.; July.

— **butyracea** Fr. Common; M.A.C., Kenora; Aug.–Oct.

— **cirrhata** Fr. What may be this species (no sclerotia were present at the base) was collected at Victoria Beach; August.

— **cirrhata** var. **Cookei** Bres. This small fungus, which develops its irregular, rounded, yellow sclerotia on decaying agarics, is not uncommon; Gimli, Kenora, Minaki.

— **colorea** Pk. Victoria Beach, M.A.C.; June–July.

— **confluens** Fr. Victoria Beach, Ingolf; July–Aug.

Collybia dryophila Fr. Common in woods everywhere from the end of May to September; occasionally in wet weather with the proliferations formerly known as *Tremella mycetophila.*

— **familia** Pk. Ingolf; Aug.

— **hariolorum** Fr. M.A.C., Victoria Beach; July–Aug.

— **hygrophoroides** Pk. This rooting reddish Collybia has been common in June around M.A.C., and has been collected also at St. Norbert, Birds Hill, and Gimli.

— **maculata** A. & S. Not uncommon in coniferous areas; Victoria Beach, Kenora; July–Sept.

— **myriadophylla** Pk. This Collybia with lilac gills occurs on coniferous wood at Gimli, Victoria Beach, Kenora; found once at M.A.C. on deciduous wood, upon which it appears not to be recorded; July–Oct.

— **radicata** Fr. In Manitoba, apparently, there is no typical *C. radicata*, but a small form occurs that may be a variety of it or a distinct species. This form is rooting, and has the cystidia of *C. radicata*, but the pilei attain a diameter of only 3·5 cm., the stem is rooting but slender, and the spores are only 9–12 × 6–7 μ. St. Norbert, M.A.C.; June–July.

— **scorzonerea** Batsch (perhaps only a form of *C. maculata*). Minaki; Sept.

— **stipitaria** Fr. On old twigs; Victoria Beach, Black Island; June–Sept.

— **tuberosa** Fr. Growing always from one end of a dark-red, elongated sclerotium; not uncommon at Victoria Beach, Kenora; Aug.–Oct. Sclerotia numerous in decaying fruit-bodies of various Hymenomycetes, noted especially in *Lactarius piperatus* parasitized by *Hypomyces lactifluorum* and in Hydnum species.

— **velutipes** Fr. Very common. Some pilei marked in autumn were found to survive our winter and to shed spores about the first of April. Found on elm, willow, and poplar. Often called the "winter fungus."

Hygrophorus borealis Pk. Victoria Beach, M.A.C.

— **Cantharellus** (Schw.) Fr. On old wood and débris; Kenora, Victoria Beach; July–Sept.

— **chlorophanus** Fr. A golden, viscid, non-blackening fungus that is evidently this species, although the spores are 9–11 × 5–6 μ. It may be a form of *H. puniceus*. M.A.C.; July.

— **chrysodon** Fr. Golden granules on the pileus and stem; Victoria Beach and Kenora; Sept. One of the mushrooms stored by our red squirrels.

Hygrophorus coccineus Fr. Kenora, M.A.C. ; Sept.–Oct.
— **colemannianus** Blox. M.A.C. ; Oct.
— **conicus** Fr. Matlock, M.A.C., Kenora, Victoria Beach ; June–Sept. The colour changes from red to black.
— **eburneus** Fr. Victoria Beach ; Sept.
— (n) **fuligineus** Frost. Minaki, M.A.C. ; Sept.–Oct.
— **hypothejus** Fr. Kenora ; Sept.
— **Laurae** Morgan. M.A.C. ; Oct.
— **marginatus** Pk. Not infrequent at Victoria Beach in July.
— **miniatus** Fr. Minaki, Kenora ; Sept.
— **nigrescens** Quel. Although apparently not recorded from North America, our specimens have the characters of this species. Pileus 6–8 cm., plane and undulate, firm, fragile, not viscid, pale golden-yellow with tinge of orange, innately silky, the fibrils and the whole pileus becoming entirely black. Flesh compact, thick, whitish, golden-yellowish near the surface, becoming black. Gills adnexed-seceding, arcuate, distant, broad, up to 15 mm. ; whitish or yellowish, becoming black, beginning at the edges. Stem 4–6 cm. by 1·5–2·5 cm., substriate and innately silky, concolorous with pileus but whitish below, turning black where bruised, becoming black within and without. Spores white in mass, 9–11 × 6–7·5 μ ; basidia 4-spored ; a few cystidia present on sides and edge of gills, about 50–55 × 10 μ. In deciduous woods ; M.A.C. ; Aug. 3, 1928. The Manitoban specimens of this striking species agree with the previous descriptions and illustrations, except that the spores are slightly shorter than was to be expected.
—(n) **nitidus** B. & C. Kenora, M.A.C. ; Sept.
—(n) **pallidus** Pk. M.A.C., Winnipeg ; Sept.
— **paludosus** Pk. Victoria Beach ; Sept. The yellow granules at the apex of the stem resemble those of *H. chrysodon.*
— **Peckii** Atk. Kenora, Birds Hill ; June–Oct. 1.
— **pratensis** Fr. Kenora ; Sept.
— **pratensis** var. **pallidus** B. & Br. Victoria Beach, M.A.C. ; Sept.–Oct.
— **psitticinus** Fr. Rare ; Kenora ; Sept.
— **pudorinus** Fr. Victoria Beach, Minaki, Kenora ; Sept.
— **Russula** (Schaeff.) Quel. Kenora, Minaki ; Sept.
— **sordidus** Pk. Victoria Beach ; Sept. A soft white Hygrophorus becoming sordid, probably this species although the spores are 8–10 × 6 μ.
— **speciosus** Pk. Minaki ; October.
— **virgineus** Fr. Kenora ; Sept.–Oct.

Laccaria laccata (Scop.) B. & Br. Common throughout the season, especially in coniferous areas as far north as Norway House. As in Europe, very variable in external appearance ; it might be called the " chameleon fungus."

— **laccata** var. **striatula** Pk. M.A.C. ; July.

— **ochropurpurea** Berk. Common ; M.A.C., Ingolf, Kenora.

— **tortilis** (Bolt.) Boud. Unexpanded plants possibly of this species were obtained at Kenora ; Sept.

Lactarius affinis Pk. Often abundant and well developed in autumn at Victoria Beach ; also at Kenora.

— **cilicioides** Fr. On sand among pines ; Victoria Beach ; Sept.

— **controversus** Fr. M.A.C., Ingolf ; Aug.

— **deliciosus** Fr. Common in coniferous areas. One of the mushrooms collected by squirrels.

— (n) **fuliginosus** Fr. Kenora ; Sept.

— **glyciosmus** Fr. Reported from Minaki.

— **helvus** Fr. Ingolf, Kenora ; Aug.–Sept.

— **indigo** Schw. This striking fungus has been collected but once, in sandy woods at Victoria Beach, Sept., 1926.

— **insulus** Fr. In frondose woods ; M.A.C., St. Norbert, Victoria Beach ; July.

— **parvus** Pk. Norway House ; August.

— **piperatus** Fr. Fairly common ; M.A.C., Kenora, Gimli. Often parasitized by *Hypomyces lactifluorum* which prevents the development of the gills and turns the pileus orange-red, in which condition it is often gathered and dried for winter use by foreigners ; it is sometimes sold on the North Winnipeg market under the erroneous name of " chanterel."

— (n) **pubescens** Fr. Ingolf ; August.

— **pyrogalus** Fr. Victoria Beach, Minaki ; Sept.

— **rufus** Fr. Common in coniferous areas ; Aug.–Sept.

— **subdulcis** Fr. Victoria Beach, Kenora ; Sept.

— **subpurpureus** Pk. On sandy soil ; Victoria Beach ; Aug.–Sept.

— **torminosus** Fr. Common ; M.A.C. to Kenora and Norway House.

— **trivialis** Fr. Victoria Beach, Ingolf.

— **turpis** Fr. Kenora ; Sept.

— **uvidus** Fr. Kenora, Ingolf, Gimli ; collected by squirrels at Treesbank.

— **vellereus** Fr. Often very large ; Kenora, Victoria Beach.

— (n) **vietus** Fr. Minaki ; Sept.

— **volemus** Fr. Ingolf ; Aug.

Lentinus cochleatus Fr. Old birch; Victoria Beach; H. J. Brodie; Aug.
— **lepideus** Fr. Everywhere on railway ties, etc.
— **sulcatus** Berk. On fallen poplar; M.A.C., St. Norbert; June.
— **vulpinus** Fr. Poplar stumps; M.A.C., Victoria Beach; Aug.
Lepiota acutaesquamosa Fr. Ingolf; Aug.
— (n) **cepaestipes** Fr. M.A.C.; Sept.
— **clypeolaria** Fr. M.A.C., Victoria Beach; July–Oct.
— **cristata** Fr. M.A.C., Victoria Beach; July–Sept.
— (n) **geniculospora** Atk. Brown pilei, bearing long spores. Ingolf, M.A.C.; Aug.
— **glioderma** Fr. Victoria Beach; Aug.
— **granulosa** Fr. Sometimes on mossy rocks; Victoria Beach, Kenora, Sept.–Oct. Transferred to Armillaria by Kauffman.
— **naucina** Fr. M.A.C., Winnipeg; July–Sept. Sometimes found on grassy boulevards.
Marasmius androsaceus Fr. On pine needles; Victoria Beach and Lake of the Woods; July–Aug.
— **cohaerens** (Fr.) Bres. Fairly common; M.A.C., etc.; July–Sept.
— **epiphyllus** Fr. Fairly common; M.A.C., Victoria Beach.
— **foetidus** Fr. On old conifer twigs; Victoria Beach; Sept.
— (n) **glabrellus** Pk. Victoria Beach; Aug.
— **minutus** Pk. On old leaves; M.A.C.; Aug.
— **oreades** Fr. On lawns; M.A.C. Not common.
— **polyphyllus** Pk. M.A.C., Gimli; June–Aug.
— **rotula** Fr. Common on old leaves and twigs; M.A.C.
— **siccus** Schw. Recorded from Winnipeg.
— (n) **spongiosus** B. & C. On sand; Victoria Beach; July.
— **urens** Fr. Victoria Beach, Kenora, M.A.C.; July–Oct.
— **velutipes** B. & C. On old leaves; M.A.C.; Aug.
Mycena acicula Fr. This beautiful little Mycena is fairly common on leaves and fallen twigs at M.A.C., Victoria Beach, etc. The spores were found to be 8–11 × 3–4 μ.
— **alcalina** Fr. M.A.C., Kenora, etc.; June–Oct.
— **ammoniaca** Fr. M.A.C., Kenora; Sept.–Oct.
— (n) **atroalboides** Pk. On old wood; Victoria Beach.
— **clavicularis** Fr. var. **luteipes** Kauff. Kenora; Sept.
— **cyanothrix** Atk. Victoria Beach.
— **dissiliens** Fr. On old wood; M.A.C.; Oct.

Mycena excisa Fr. Kenora, Victoria Beach ; Aug.–Sept.
— **galericulata** Fr. M.A.C., Victoria Beach ; July–Oct.
— **haematopa** Fr. M.A.C., Victoria Beach, Indian Bay ; June–July.
— **inclinata** Fr. or var. M.A.C., Victoria Beach ; July–Oct.
— **leptocephala** Fr. M.A.C. ; June–Oct.
— **minutula** Pk. M.A.C., Keewatin ; June–Aug.
— **parabolica** Fr. On old wood ; Victoria Beach ; Sept.
— **pelianthina** Fr. M.A.C. ; July–Sept.
— **polygramma** Fr. var. **albida** Kauff. M.A.C. ; June.
— **pura** Fr. Common ; M.A.C., Victoria Beach, Kenora. The colour varies from white to shades of reddish-blue.
— **purpureofusca** Pk. Victoria Beach ; July.
Omphalia campanella Fr. Very common in coniferous areas from May to Oct. Usually in troops on fallen, well-decayed, coniferous trunks in woods.
— **epichysium** Fr. M.A.C., Victoria Beach, Kenora ; June–Sept.
— **fibula** Fr. Kenora ; Oct.
— (n) **onisca** Fr. M.A.C. ; Aug.–Sept.
— (n) **rugosodisca** Pk. On old wood ; Victoria Beach ; Sept.
— (n) **scyphiformis** Fr. Victoria Beach ; Sept.
— **umbellifera** Fr. On old log ; Minaki ; Sept.
Panus angustatus Berk. On old wood ; Victoria Beach ; June–Aug.
— **rudis** Fr. Common on old frondose wood ; M.A.C., Kenora, Victoria Beach ; June–Oct.
— **stypticus** Fr. var. **luminescens** Buller. Occasional on old wood of poplar, birch, oak ; M.A.C., Kenora. Pilei luminous when moist, and mycelium in culture also luminous.
Pleurotus applicatus Fr. On old wood ; M.A.C. Probably widespread.
— **atrocaeruleus** Fr. var. **minimus** Dearness and Bisby, n. var. Pilei only 5–10 mm. broad ; spores 7–10 × 4–5 μ, white in mass ; cystidia 35–60 × 10–13 μ, roughened above, brownish below ; otherwise resembling var. *griseus* Pk. On old wood, Victoria Beach, June 2 and June 13, 1928.
— **atropellitus** Pk. On old wood ; Victoria Beach ; Aug.
— **circinatus** Fr. Reported at Winnipeg.
— **elongatipes** Pk. On old Acer logs ; M.A.C. ; August.
— **fimbriatus** Fr. or a variety. Old logs ; Victoria Beach ; Sept.
— **ostreatus** Fr. Common and widespread on old wood.

Pleurotus petaloides Fr. On old wood; Victoria Beach, Minaki; Aug.–Sept.

— **sapidus** Kalch. On old logs; Winnipeg.

— **septicus** Fr. On old wood; M.A.C.; July.

— **subareolatus** Pk. or a variety. Old wood; M.A.C., Kildonan Park; Aug.–Sept.

— **subpalmatus** Fr. A specimen of this noteworthy species, with gelatinous, coarsely reticulated cuticle on the pileus, and with globose echinulate spores, 6–8 μ, was found at M.A.C., July 31, 1928. Seen once previously in Winnipeg. Illustrated by Cooke as *Pluteus phlebophorus*.

— **ulmarius** Fr. Very common on living and dead Acer, elm, etc., in autumn. The pilei are frequently seen protruding from wounds made by sawing off large branches. It is a wound parasite, but apparently does not cause the death of the trees.

Russula albida Pk. M.A.C.; July–Aug.

— **albidula** Pk. Ingolf, Victoria Beach; Aug.–Sept.

— **alutacea** Fr. Victoria Beach; Sept.

— **amygdaloides** Kauff. M.A.C.; Aug.

— **aurantialutea** Kauff. M.A.C., Ingolf. Collected by squirrels at Minaki.

— **borealis** Kauff. Minaki, Victoria Beach, M.A.C.; Aug.–Oct.

— **chamaeleontina** Fr. Norway House, M.A.C.; Aug.

— **decolorans** Fr. Common on sandy soil among *Pinus Banksiana*; Victoria Beach, etc.; Aug.–Sept.

— **delica** Fr. M.A.C., Victoria Beach, Kenora; July–Sept.

— **densifolia** Sacc. Plants agreeing with this species, with flesh turning reddish then black, were found in sandy pine woods at Victoria Beach; July–Aug.

— **emetica** Fr. Not uncommon; July–Sept.

— **fallax** Cke. Norway House, Victoria Beach, M.A.C.

— **flava** Rom. Common among pines; Victoria Beach.

— (n) **flaviceps** Pk. M.A.C.; July.

— **foetens** Fr. Victoria Beach; July–Aug.

— **fragilis** Fr. Victoria Beach, Kenora; Aug.–Sept.

— **graminicolor** Quel. (*R. aeruginea*). Victoria Beach, Norway House, Ingolf, M.A.C.; Aug.–Sept.

— **integra** Fr. Gimli, Victoria Beach, Ingolf; Aug.–Sept.

— (n) **lutea** Fr. Ingolf, M.A.C.; July–Aug.

— **nigricans** Fr. Victoria Beach, Minaki; Sept.–Oct.

— (n) **ochraleucoides** Kauff. Ingolf; July.

— (n) **roseipes** Secr.-Bres. M.A.C.; July.

— **sanguinea** Fr. M.A.C.; July–Aug.

Russula sordida Fr. Victoria Beach, Ingolf ; Aug.–Sept.
— **tenuiceps** Kauff. Victoria Beach ; July.
— (n) **veternosa** Fr. Ingolf ; Aug.
— **virescens** Fr. Victoria Beach, Kenora ; Sept.
— **xerampelina** Fr. Victoria Beach, Ingolf, M.A.C. ; July, Sept.

Schizophyllum commune Fr. Everywhere on dead wood, especially on stumps and trunks. The pilei withstand natural desiccation, and retain their viability through the winter.

Tricholoma aurantium (Schaeff.) Fr. Victoria Beach, Ingolf ; July–Sept.
— **brevipes** (Bull.) Fr. (similar to *T. melaleucum*, but stem brown within). In woods ; M.A.C. ; July–Sept.
— (n) **cinerascens** Fr. Ingolf, M.A.C. ; Aug.–Sept.
— **equestre** Fr. Victoria Beach, Kenora ; Sept.–Oct.
— (n) **fumosoluteum** Pk. Victoria Beach ; Sept.
— **melaleucum** Fr. Common on lawn ; M.A.C. ; Sept.–Oct., rarely in June.
— **nudum** Fr. Victoria Beach, M.A.C., Minaki ; Aug.–Sept.
— **odorum** Pk. Minaki ; Oct.
— (n) **patulum** Fr. M.A.C. ; Aug.–Sept.
— **panaeolum** var. **caespitosum** Bres. Victoria Beach.
— **personatum** Fr. Common and widespread in autumn in woods. Pilei scattered or in troops, or occasionally in interrupted fairy rings.
— (n) **portentosum** Fr. Kenora ; Sept.
— **rutilans** Fr. Victoria Beach, Kenora ; Sept.
— (n) **subacutum** Pk. Minaki, Victoria Beach ; Sept.–Oct.
— (n) **subluteum** Pk. Large yellowish plants with globose spores and solid stem. Victoria Beach ; Sept.
— **terreum** Fr. Ingolf ; common, M.A.C. ; July–Oct.
— **transmutans** Pk. Victoria Beach, Minaki, M.A.C. ; Sept.–Oct.
— **tumidum** Fr. Victoria Beach ; Sept.

Trogia crispa Fr. Common on old wood, especially birch ; Norway House southward.

(2) Rhodosporae

Claudopus (n) **byssisedus** Fr. On rotten wood ; M.A.C. ; Aug. Spores 8–9 × 6 μ.
— **mephiticus** Murr. This striking species, well named because of its penetrating mephitic odour when fresh, is common on old deciduous wood or stumps, or around the base of living trees, along the Red River, M.A.C. to

St. Norbert, in July, and more rarely in August or even to the middle of September. From repeated examination of fresh specimens we are able to supplement the original description in *Mycologia* (7 : 290, 1915). Pileus usually eccentric, sometimes central, convex, plane, or concave, gregarious or scattered, 2–6 cm. broad, surface dry, innately silky, slightly concentrically zoned, white to grayish, sometimes with a tinge of green when young, fragile, margin persistently incurved ; context thin, watery-white, odour when fresh or while drying resembling that of a skunk, but with a suggestion also of garlic. Gills adnate to sinuate, broad, tending to break as the pileus expands, thick on edge and slightly serrate, white becoming rose-coloured. Stem 1–2 cm. by 5–7 mm., innately silky, solid, white. Spores angular, deep-rosy to brick-reddish in mass, 8–11 × 6–7·5 μ.

Claudopus nidulans Fr. Common throughout Manitoba on old wood in autumn, and sometimes overwintering to shed spores the following spring.

Clitopilus noveboracensis Pk. (probably *C. popinalis* Fr.). On leaf-mould, sometimes on old wood ; Victoria Beach, Minaki ; July–Sept.

— (n) **subplanus** Pk. M.A.C. ; July.

— (n) **subvilis** Pk. Kenora ; Sept.

Eccilia (n) **griseo-rubella** Fr. In soil ; St. Jean ; Sept.

— (n) **nivea** Pk. Sandy soil ; Victoria Beach ; July.

— (n) **roseoalbocitrina** Atk. M.A.C. ; Aug.

Entoloma alcalinum Murr. Lacerate-scaly grayish-brown pileus and nitrofarinaceous odour and taste ; spores 8–10 × 6–8 μ. Kenora ; Oct. 1.

— (n) **clypeatum** Fr. Kenora ; Sept.

— (n) **grayanum** Pk. Ingolf ; Aug.

— **griseum** Pk. Kenora ; M.A.C. On ground in orchard ; July–Oct.

— **peckianum** Burt. or a variety. Victoria Beach ; June–Sept.

— (n) **rhodopolium** Fr. Kenora ; Sept.

— **sericatum** Britz. M.A.C. ; Aug.

— **sericeum** Fr. M.A.C., Victoria Beach ; July–Sept.

— **strictius** Pk. Swampy woods ; Victoria Beach ; Aug.

Leptonia asprella Fr. Kenora, M.A.C. ; July–Oct.

— (n) **formosa** Fr. In low woods ; Kenora ; Sept.

— **grisea** Pk. Common, M.A.C. ; July.

— **seticeps** Atk. On old wood ; Victoria Beach ; June.

Nolanea (n) **dysthales** (Pk.) Atk. M.A.C. ; July.

Nolanea (n) **fuscogrisella** Pk. On moss; Victoria Beach; July.
— **mammosa** Fr. M.A.C.; July.
Pluteus admirabilis Pk. On old wood; Victoria Beach, Gimli, Kenora; June–Sept.
— **cervinus** Fr. Common on old wood and sawdust; Victoria Beach, M.A.C., Kenora; Aug.–Oct.
— (n) **ephebius** Fr. M.A.C.; July.
— **granularis** Pk. On old wood; Victoria Beach; July–Aug.
— **granularis** var. **umbrosellus** Atk. Victoria Beach; June.
— **leoninus** Fr. On old wood; M.A.C., Victoria Beach; June–July.
— **longistriatus** Pk. Old wood; Victoria Beach; June.
— **nanus** Fr. On old wood; M.A.C.; June–Sept. A few pilei appear throughout the summer.
— **nanus** var. **lutescens** Fr. M.A.C.; July.
— **salicinus** Fr. or variety. With base of stem blue-green; stem and pileus showing more green as they dry. Old wood; M.A.C.; July–Aug.
— **sterilomarginatus** Pk. Old wood; Victoria Beach; July.
— **tomentosulus** Pk. Old damp wood; M.A.C., Victoria Beach; June–Aug.
— **umbrosus** Fr. On sawdust piles; Minaki, Kenora; Sept.–Oct.
Volvaria gloiocephala Fr. Margin striate, no cystidia, spores 12–16 × 7–8 μ. In alfalfa field; M.A.C.; June.
— **pubescentipes** Pk. Ingolf; Aug.
— **pusilla** Fr. Fairly common on ground in damp woods; M.A.C., Victoria Beach. Pileus innately silky with a smooth almost viscid feel, but not really viscid, scarcely striate, but becoming rimose. The pileus is white except for a slight umber tinge on the small umbo. July–Sept.
— **speciosa** Fr. Rich soil; M.A.C., Gimli, Matlock; July–Oct.
— **striatula** Pk. On lawn; M.A.C.; July–Sept.

(3) Ochrosporeae

Bolbitius fragilis Fr. This form with glabrous yellow stem is rare; woods; M.A.C.; June.
— **tener** Berk. Rare on lawn; M.A.C.; July.
— **vitellinus** Fr. On dung; M.A.C., Kenora, etc.; June–Sept.
Cortinarius acutus Fr. Victoria Beach; Sept.
— **alboviolaceus** Fr. Not uncommon; M.A.C., Ingolf, Kenora.
— **annulatus** Pk. M.A.C.; July–Sept.
— **anomalus** Fr. Victoria Beach, Kenora; Sept.–Oct.

Cortinarius argentatus Fr. or var. Victoria Beach ; Sept.
— **armillatus** Fr. Common ; Victoria Beach, Kenora, etc. ; Sept.
— **Atkinsonianus** Kauff. A striking species ; Victoria Beach.
— (n) **brunneofulvus** Fr. M.A.C., Minaki ; Sept.
— **calochrous** Fr. Norway House ; Aug.
— **cinnabarinus** Fr. Victoria Beach, Kenora ; Aug.
— **cinnamoneus** Fr. Kenora, Ingolf ; Aug.–Oct.
— (n) **claricolor** Fr. M.A.C. ; July–Sept.
— **coloratus** Pk. M.A.C., Victoria Beach ; Aug.–Oct.
— (n) **communis** Pk. Victoria Beach ; Sept.
— (n) **croceocolor** Kauff. M.A.C. ; Aug.
— (n) **cylindripes** Kauff. Victoria Beach, Kenora ; Aug.–Oct.
— **decoloratus** Fr. M.A.C., Kenora ; Sept.
— **distans** Pk. M.A.C. ; July–Sept.
— **elegantior** Fr. or var. Minaki ; Sept.
— **erugatus** Fr. Victoria Beach, M.A.C. ; Sept.
— (n) **fuscoviolaceus** Pk. Spores 8–10 × 4–5. Minaki.
— **hemitrichus** Fr. Minaki ; Sept.
— **herpeticus** Fr. Victoria Beach ; July.
— **impolitus** Kauff. Victoria Beach ; Sept.
— (n) **infractus** (Pers.) Bres. Victoria Beach ; Sept.
— **lilacinus** Pk. M.A.C. ; Aug.–Sept.
— **ligniarius** Pk. On old wood ; Victoria Beach ; Sept.
— **mucifluus** Fr. Common in autumn ; occasionally in spring (June, early July) ; M.A.C., Victoria Beach, Kenora.
— **olivaceus** Pk. Minaki, Victoria Beach ; Sept.
— **paleaceus** Fr. Victoria Beach, Kenora ; Sept.
— **pholideus** Fr. Victoria Beach, Kenora, M.A.C.
— **plumiger** Fr. Victoria Beach ; Sept.
— (n) **purpureophyllus** Kauff. Victoria Beach ; Sept.
— **raphanoides** Fr. Victoria Beach ; Sept.
— **rubricosus** Fr., variety. Minaki ; Sept.
— (n) **rubrocinereus** Pk. Victoria Beach ; Sept.
— **sanguineus** Fr. Victoria Beach ; Sept.
— **semisanguineus** Fr. Common ; Ingolf, Victoria Beach.
— **sphaerosporus** Pk. Victoria Beach ; Sept.
— (n) **squamulosus** Pk. Victoria Beach ; Aug.
— **subpulchrifolius** Kauff. M.A.C. ; Aug.–Sept.
— **uraceus** Fr. Kenora, M.A.C. ; Sept.–Oct.
— **velicopia** Kauff. Victoria Beach ; Sept.
— **violaceus** Fr. Victoria Beach, Kenora, Ingolf ; Aug.–Sept. Only a few specimens of this striking fungus were found each year.

Crepidotus applanatus Fr. Ingolf ; Aug.
— **calolepis** Fr. On old poplar wood, etc., M.A.C. ; and on chips, Minaki ; June–Sept.
— **cinnabarinus** Pk. M.A.C., Matlock ; July–Sept. This beautiful little fungus is fairly common in this area, having been found about a dozen times on old poplar logs. Spore-prints have been obtained to demonstrate the brown spores. This species, reported by Kauffman as having been found only twice in Michigan, has since been recorded from Illinois and Iowa ; reported also from Ohio and Alabama.
— **dorsalis** Pk. Victoria Beach, M.A.C. ; July.
— **fulvotomentosus** Pk. Victoria Beach, M.A.C. ; July–Aug.
— **haerens** Pk. This viscid species is occasionally found on old poplar ; M.A.C. ; June–Oct.
— **herbarum** Pk. Norway House, Swan River, Victoria Beach, M.A.C.
— **malachius** B. & C. Victoria Beach ; July–Aug.
— **mollis** Fr. M.A.C. ; June–Sept.
— **nidulans** (Pers.) Quel. Although we have not seen this recorded from North America, our specimens were not found to fit any other description. The gills are orange-tawny when fresh, but the spores are rusty. On old pine boards ; M.A.C. ; August.
— **putrigenus** B. & C. Victoria Beach ; Aug.
— **sepiarius** Pk. Fairly common on old poplar, sometimes also apparently on coniferous wood. When on the top of a fallen log the stem may be central. M.A.C., Victoria Beach ; July–Aug.
— **versutus** Pk. Fairly common ; M.A.C., Gimli.
Flammula flavida (Schaeff.) Fr. Minaki ; Sept.
— **lubrica** Fr. Ingolf, Victoria Beach ; Aug.–Sept.
— **polychroa** Berk. Birds Hill ; Sept.
— **sapinea** Fr. Common on coniferous wood ; Kenora, Norway House, Victoria Beach, M.A.C.
— **spumosa** Fr. M.A.C., Kenora ; Sept.–Oct.
Galera bulbifera Kauff. On dung ; Victoria Beach ; not uncommon in old horse-dung cultures in the laboratory. Known by its bulbous base.
— **capillaripes** Pk. Occasional, M.A.C. ; Aug.–Oct.
— **hypnorum** Fr. On mosses ; Victoria Beach, Kenora ; Aug.–Oct.
— **inculta** Pk. On sawdust in an ice-house ; M.A.C. ; Sept.–Oct.
— (n) **pubescens** Gill. Minaki ; Sept.

Galera tenera Fr. Gimli, Victoria Beach, M.A.C.; June–Sept.
— **teneroides** Pk. M.A.C.; June–Aug.
Hebeloma albidulum Pk. M.A.C.; Aug.–Oct.
— (n) **album** Pk. Kenora; Sept.
— **Colvini** Pk. Not uncommon on sandy beach; Victoria Beach; Sept.
— **crustuliniforme** Fr. M.A.C.; Sept.
— (n) **longicaudum** Fr. On Sphagnum; Norway House.
— **sinapizans** Fr. Victoria Beach; Sept.
— (n) **velatum** Pk. M.A.C.; Sept.
Inocybe asterospora Quel. Victoria Beach; Aug.
— (n) **caesarita** Fr. M.A.C.; July–Sept.
— **cicatricata** E. & E. Victoria Beach on sand; Aug.
— **Cookei** Bres. M.A.C.; Aug.–Sept.
— **corydalina** Quel. M.A.C.; Aug. Stem sub-bulbous.
— **decipientoides** Pk. Victoria Beach; Aug.
— (n) **eutheloides** Pk. M.A.C.; Aug.–Oct.
— **fastigiata** Bres. Common; Manitou, Treesbank, Gilbert Plains, M.A.C., Victoria Beach.
— (n) **fastigiella** Atk. M.A.C.; Sept.
— **fibrosa** Bres. (but gills scarcely free). M.A.C.; July.
— **flocculosa** Berk. Ingolf, St. Norbert, Victoria Beach; July–Sept.
— **frumentacea** Bres. M.A.C.; July–Sept.
— **geophylla** Fr. Fairly common; M.A.C., Victoria Beach; July–Sept.
— (n) **Godeyi** Gill. Victoria Beach; Aug.
— **infelix** Pk. Kenora; Sept.
— **leptophylla** Atk. This fine species is fairly common at Victoria Beach; June–Sept.
— **lilacina** Fr. Not uncommon; M.A.C.; Aug.–Oct.
— **minima** Pk. Norway House, Victoria Beach, M.A.C.
— **pallidipes** E. & E. M.A.C., Victoria Beach; June–Sept.
— **pyriodora** (Pers.) Bres. M.A.C.; July.
— (n) **radiata** Pk. Victoria Beach; Aug.
— **rimosioides** Pk. M.A.C.; Sept.–Oct.
— **rufidula** Kauff. M.A.C., Victoria Beach, Ingolf; Aug.–Oct.
— **sindonia** Fr. Woods, M.A.C.; Aug.
— **subdestricta** Kauff. Victoria Beach, M.A.C., Kenora; July–Sept.
— (n) **violaceifolia** Pk. Pileus 10–15 mm., subconic, brownish, silky; stripe violet, young gills violet; spores 9–10 × 4·5 – 5 μ; crystidia on sides and edges of gills, about 45 × 14 μ. Indian Bay, M.A.C.; Aug.–Sept.

Inocybe (n) **virgata** Atk. Moist woods ; M.A.C. ; July.
Naucoria (n) **bellula** Pk. Old coniferous wood ; Victoria Beach ; Sept.
— **centuncula** Fr. Old wood ; M.A.C. ; June–Aug.
— (n) **horizontalis** Fr. Victoria Beach ; Aug.
— **lignicola** Pk. M.A.C., Victoria Beach, Birds Hill, Kenora ; Aug.–Oct.
— **pediades** Fr. Norway House, M.A.C. ; July–Aug.
— **semiorbicularis** Fr. On lawns ; M.A.C., Morden ; July–Aug.
— **siparia** Fr. Victoria Beach ; July.
— **vernalis** Pk. M.A.C. ; May–June.
Paxillus involutus Fr. Minaki, M.A.C. ; July–Sept. Often abundant at M.A.C.
— **panuoides** Fr. Not common ; on sawdust ; Gimli.
Pholiota adiposa Fr. Occasional ; Victoria Beach, M.A.C.
— **aggericola** Pk. Victoria Beach ; July–Sept.
— **angustipes** Pk. From wood or buried sticks ; M.A.C. ; Sept.–Oct.
— (n) **blattaria** Fr. M.A.C., Victoria Beach ; June–Aug.
— **caperata** Fr. Ingolf, Kenora ; Aug.–Oct.
— **confragosa** Fr. On wood ; Victoria Beach ; June–July.
— **destruens** Brond. Old wood ; Gimli ; Aug.
— (n) **discolor** Pk. Old wood ; Victoria Beach ; Sept.
— **erebia** Fr. Leaf-mould ; Victoria Beach ; Sept.
— **erinaceela** Pk. On twigs ; M.A.C. ; June–Aug.
— **fulvo-squamosa** Pk. Large striking plants. Evidently this species is rather common around trees at M.A.C. ; also at Victoria Beach. The purplish spores suggest Psalliota. June, but mostly Sept.–Oct.
— **marginella** Pk. On old wood ; M.A.C. ; Sept.
— (n) **muricata** Fr. On old logs ; M.A.C. ; July.
— **mutabilis** (Schaeff.) Fr. On old wood ; Victoria Beach ; June.
— **praecox** Fr. On the ground ; M.A.C. ; June.
— **rugosa** Pk. In an ice-house ; M.A.C. ; Sept.
— **spectabilis** Fr. Has occurred for three years on one large fallen log at M.A.C. ; also at Victoria Beach ; June–Oct.
— **squarrosa** Fr. With spores larger than the next ; Victoria Beach, Minaki ; Sept.
— **squarrosoides** Pk. More common than the preceding ; M.A.C., Gimli, Victoria Beach, Minaki ; July–Oct.
— (n) **togularis** (Bull.) Quel. Victoria Beach, M.A.C. ; June–Oct.
— **unicolor** (Vahl.) Fr. On old wood and sawdust ; M.A.C., Birds Hill ; Sept.–Oct.

Pholiota vermiflua Pk. Reported.

Pluteolus coprophilus Pk. On manure piles and on dung cultures in the laboratory ; Winnipeg.

— **expansus** Pk. On débris and rich soil ; M.A.C., Matlock ; July.

— **reticulatus** Fr. On old wood ; M.A.C., Victoria Beach ; July–Sept.

Tubaria furfuracea Gill. Common on stumps, etc. ; M.A.C., Gimli ; Aug.–Oct.

— **inquilina** (Fr.) Gill. On sawdust in an ice-house ; M.A.C. ; Sept.–Oct.

(4) Porphyrosporae

Hypholoma appendiculatum Fr. M.A.C., Victoria Beach ; July–Oct.

— **coronatum** Fr. M.A.C. ; July.

— **fasciculare** Fr. Gimli, Victoria Beach, Kenora ; June–Sept.

— **hydrophilum** Fr. Both the forms described by Kauffman have been found. M.A.C., Minaki ; July–Sept.

— (n) **hymenocephalum** Pk. M.A.C. ; July.

— **incertum** Fr. On lawns, etc. ; M.A.C., Victoria Beach, St. Norbert ; June–Oct.

— **incertum** var. **sylvestris** Kauff. In woods ; M.A.C. ; June–July.

— **lachrymabundum** (Fr.) Quel. Specimens are occasionally found that appear to be this species.

— **rugocephalum** Atk. M.A.C. ; July.

— **saccharinophilum** Pk. M.A.C., Birds Hill ; June–Sept.

— **sublateritium** Fr. M.A.C., Victoria Beach ; June–July.

— **velutinum** (Fr.) Quel. M.A.C., Victoria Beach ; June–Oct. A form, evidently of this species but with spores nearly smooth, is common on lawns at M.A.C.

— **vinosum** Kauff. Found once ; M.A.C. ; Aug.

Hypholoma longipes Dearness and Bisby, n. sp. Pileus 6–14 cm., separate or cespitose, globose then hemispheric, finally planoconvex, sometimes upturned on the margin and broadly umbonate, radiately floccose-striate especially towards the margin, viscid, whitish with lavender tinge, then buff, drying buff to buckthorn brown ; flesh whitish, thin to the umbo, taste and odour mild. Gills broad, chocolate-brown, adnate or arcuate and adnato-decurrent by ridges on the stem ; whitish at first, soon purplish and mottled, edge white-fimbriate not distilling droplets ; clusters of 8–20 sterile cells, subventricose, often capitate, 55–75 × 10–15 μ, on edge of gills. Cystidia not observed on sides of gills. Stem 6–18 × 1–2 cm., shining, concolorous or paler than the cap, sometimes brownish-purple at the base, even, innately fibrillose, striate, hollow, easily splitting; veil whitish at first, evanescent, sometimes remnants found near base of stem. Spores purple-brown, sub-elliptic, smooth under oil-immersion lens, 9–12·5 × 5–7 μ.

Growing throughout the season on or near the floor of an old " dug-out " whose walls and roof had been supported by poplar poles. M.A.C. First collected Oct. 27, 1927; several times from June 15 to late in Oct. 1928. *3581* (D. *6827*). This fine species suggests *Psilocybe larga* Kauff., but *P. larga* is hygrophanous and has crystidia on the sides of the gills.

Psalliota abruptibulba Pk. In woods; M.A.C., Victoria Beach, Kenora; Aug.–Sept.
— **arvensis** Fr. Victoria Beach, Winnipeg; July–Aug.
— **campestris** Fr. Lawns, etc.; M.A.C., and elsewhere. Usually in autumn.
— (n) **comtula** Fr. Woods; M.A.C.; Aug.
— **diminutiva** Pk. Victoria Beach; July.
— **haemorrhodaria** Fr. Victoria Beach; Sept.
— (n) **placomyces** Pk. Winnipeg; Aug.
— **Rodmani** Pk. M.A.C. campus; June.
— **subrufescens** Pk. M.A.C.; Sept.
Psathyra persimplex Britz. Mossy wood; M.A.C.; Sept.
— (n) **semivestita** Berk. & Br. On dung; M.A.C.; July.
— **umbonata** Pk. On decayed wood; M.A.C.; June–Sept.
Psilocybe (n) **agrariella** Atk. Winnipeg; June.
— **atrobrunnea** Fr. Among Sphagnum; Kenora; Sept. Spores 13–15 × 6–6·5 μ.
— **foenisecii** Fr. Common among grass; M.A.C., Victoria Beach; June–Sept.
— (n) **merdaria** Fr. On horse dung; M.A.C.; July. Spores 10–13 × 7–8 μ.
— (n) **murcida** Fr. Damp rich soil in woods; M.A.C., Kenora, Birds Hill; July–Oct.
— **phyllogena** Pk. Small specimens, agreeing fairly well with description except in their being found among moss on sand; Victoria Beach.
— **subviscida** Pk. On lawns and débris; M.A.C.; June–Aug.
— **uda** (Fr.) Bat. M.A.C.; Aug.
Stropharia aeruginosa Fr. On old dung; M.A.C.; Aug.–Sept.
— **albonitens** Fr. In woods; M.A.C.; Sept.

Stropharia coronilla Bres. In woods ; M.A.C. ; Sept.

— **epimyces** (Pk.) Atk. On Coprini. Reported by Kauffman to have been seen by Pennington " as far west as Winnipeg," but Professor Pennington writes that the specimens referred to were found in 1913 on *Coprinus comatus* in Ontario north of Lake Superior, probably at Whitefish Bay. Dr. Pennington did not collect fungi in Manitoba (letter Dec. 7, 1928). This parasitic mushroom may occur in the Province, but we have not yet seen it there.

— **semiglobata** Fr. On dung ; M.A.C., Victoria Beach.

— **stercoraria** Fr. On dung. Spores up to 24 × 12 μ. Probably a form of the preceding.

— (n) **umbonatescens** Pk. Victoria Beach, M.A.C. ; Aug.–Sept.

(5) Melanosporae

Anellaria separata Karst. Gimli, Victoria Beach, Norway House, M.A.C.

Coprinus atramentarius Fr. The Inky Cap is very common and widespread. Never coprophilous, but occurs around stumps over buried roots, etc., and is lignicolous. Described and fully illustrated by one of us (A. H. R. B., *Researches on Fungi*, particularly considered in vol. 3, chap. 9).

— **brevi-lanatus** Buller (*nomen nudum, ibid.*, vol. 3 : 308). Near *C. lagopus.*

— **comatus** Fr. The Shaggy Mane is common, and has been described fully (*ibid.*, vol. 3, chap. 9 ; vol. 1, chap. 19). *C. ovatus* Schaeff., as illustrated by Cooke in plate 659, is undoubtedly a starved form of *C. comatus.*

— **cordisporus** Gibbs. Characterized by its heart-shaped spores, not uncommon as a coprophilous species coming up along with *C. curtus* and *C. ephemerus*, University of Manitoba.

— **curtus** Kalchbr. (*C. plicatiloides* Buller, *ibid.* vol. 1, p. 67 ; to be discussed in vol. 4). Common on dung ; very young pileus foxy-red ; expanded pileus bearing minute reddish or whitish scales interspersed with clavate hairs ; small disc finally depressed ; spores deep-black, cystidia absent.

— **domesticus** Fr. (*ibid.* vol. 3, pp. 41–43, 338). A species somewhat similar in appearance to *C. micaceus* ; found in woods on old logs, especially elm. Distinguished by the red ozonium (*O. radians* Pers., *O. auricomum* Link) which develops between the bark and the wood, and gives rise to the fruit-bodies. Spores brownish. Winnipeg, M.A.C.; cultured in the laboratory, University of Manitoba, from pieces of elm bark. *C. radians* (Desm.) Fr. is a synonym.

Coprinus ephemerus Fr. This name has been applied in the literature to several small coprophilous Coprini with slender stipes. We are using this name for the form with brownish pilei bearing numerous cylindrical or pointed hairs (pilocystidia), expanding at night, and without cystidia. Common, Winnipeg, M.A.C., usually found in laboratory horse-dung cultures.

— **fimetarius** Fr. Commonly reported in the literature; no doubt a synonym of *C. lagopus* as given below.

— **flavo-lanatus** Buller. *Nomen nudum* (*ibid.*, vol. 3, pp. 3–8). Near *C. lagopus*, differing in the pileus having a yellowish-white down composed of thin branched cells and also in its more slender cystidia. To be described.

— **hemerobius** Fries. Probably a form of *C. plicatilis* (*ibid.*, vol. 4, forthcoming). Among leaves and grass in woods, M.A.C.

— **Hendersonii** Berk. Rare on old horse-dung cultures, University of Manitoba. Characterized by a distinct annulus on the lower or middle part of the stem. Pileus 7–10 mm. wide, with a lemon-tinge at first, and a scaly meal. Stem up to 35 mm. long; cystidia present; spores rounded-pyriform, 8–10 × 7–8 μ.

— **lagopus** Fr. (For details and illustrations *ibid.*, vol. 3, chap. 10). Common on horse dung. Shown by Hanna (*Ann. Bot.*, 39 : 431–457, 1925) to be identical in Canada and England. Distinguished from the species which accompany it by the whitish hairy tufts or scales on the pilei.

— **macrorhizus** (Pers.) Rea. Common on heating stable manure in Europe and in North America including Manitoba. Very rare in laboratory cultures. Pseudorhizae of variable length, sometimes absent. Gills wider than those of *C. lagopus* and, as can be seen in the field, held together by cystidia while autodigestion is in progress (*ibid.*, vols. 2, 3, and, for the pseudorhiza, 4).

— **micaceus** Fr. Common around roots of old stumps, etc., and lignicolous; never coprophilous. Basidia tetramorphic. Meal-cells rounded and not ornamented with crystals of calcium oxalate (*ibid.*, vol. 3, chap. 11).

— **narcoticus** Fr. On old wet horse dung in the laboratory, University of Manitoba, in 1912 and 1922. Known by its strong, unpleasant odour and by the apparently unique feature of possessing basidia normally tristerigmatic and trisporous (*ibid.*, vol. 2, pp. 318–319, etc.; vol. 3, p. 293, etc.).

Coprinus niveus Fr. Found only on horse dung. Pilei snow-white, covered with pulverulent meal (*ibid.*, vols. 2 and 3).

— **ovatus** Schaeff. Evidently a depauperate form of *C. comatus*; Winnipeg.

— **plicatilis** Fr. Common on ground in woods. Its gills do not deliquesce, so that it may be mistaken for a Psathyrella; but it belongs to Coprinus because the spores ripen and are discharged from below upwards on each gill, and the basidia are dimorphic (*vide* Buller, *Trans. Brit. Myc. Soc.*, 5: 482). Never coprophilous nor lignicolous, but apparently graminicolous. Pileus does not become revolute, but remains broadly convex. (Buller's *Researches on Fungi*, vols. 1, 2, 3, and especially 4).

— (n) **quadrifidus** Pk. On an old stump; Winnipeg.

— **Rostrupianus** Hansen. Sclerotia have been found to be common at M.A.C. each autumn from 1923 to 1928 on the lower sides of old weathered masses of cow dung in pastures; also collected at Kenora. Cultured, with production of fruit-bodies, in the laboratory, University of Manitoba. Illustrated and discussed by Dorothy Newton (*Ann. Bot.*, 40: 105–128, 1926). Apparently not previously found in North America.

— **stercorarius** Fr. Can always be obtained on fresh cow dung kept wet in laboratory cultures, and often occurs also on wet horse dung. Small rounded black sclerotia develop on the surface of the dung, each of which, after a period of rest, may produce one to several grayish-white fruit-bodies covered with fugaceous meal-cells ornamented with crystals of calcium oxalate. M.A.C., University of Manitoba (*Researches on Fungi*, vols. 1, 2, and 3).

— **sterquilinus** Fr. Not infrequent on balls of horse dung in laboratory cultures. A white mycelium is produced on the exterior of the dung, from which the large fruit-bodies appear after four to six weeks. This is the only species of Coprinus in which the upper part of the stem has been found always to turn black as the pileus expands (*ibid.*, vols. 1, 2, and 3, and *Jahrb. f. Wiss. Bot.*, 56: 299–329, 1915).

The three **new species** following are placed together, out of alphabetical order, to facilitate comparison. Other fimicolous forms of Coprinus have been observed, but they require further study.

Coprinus longipes Buller, n. sp. Pileus 6–10 mm. high before expansion, bay-brown, darker at the obtuse apex, at first conico-campanulate, on expanding becoming broadly convex but never becoming flattened or revolute, thus resembling the pileus of *C. plicatilis*; when fully expanded 13–23 mm. broad, usually 15–18 mm.; the disc 3–4 mm. wide, reddish-brown and markedly depressed; the convex sides of the pileus grayish-brown and beautifully plicate, the surface of the pileus lacking both hairs and scales. Stipe sometimes only 4–5 cm. long, but usually 6–11 cm., occasionally up to 15 cm. long, evenly cylindrical, 1–1·5 mm. in diameter except at the base where it is 2 mm., straight, somewhat brownish below, white above, smooth, hollow, somewhat stiff. Gills grayish, narrow, 1–1·5 mm. wide, free and attached to a collar below the disc, autodigestion occurring to some extent along the edges. Flesh very thin, brownish at the disc. Spores black in the mass, jet-black under the microscope, smooth, rounded heart-shaped with three differing dimensions, 14–15·5 × 12–13 × 10 μ. Basidia dimorphic, each surrounded by 5–8 paraphyses. Cystidia on the sides of the gills, ovoid-tapering, sometimes capitate, fairly numerous in the young pilei but disappearing by deliquescence during spore-discharge. Observed on a number of occasions in laboratory horse-dung cultures, coming up after several weeks or months.

This species resembles *C. plicatilis* in general appearance, and might be mistaken for it; but it differs in coming up on horse dung instead of in grassy places, in having a slightly smaller depressed disc, in having gills which waste or deliquesce at their edges instead of remaining entire, and in having a stipe which is usually longer.

Coprinus parvisporus Buller, n. sp. Pileus 4–6 mm. high and 2–3 mm. wide before expansion, cylindrical except at the rounded apex, expanding conically about midnight, becoming flattened and then revolute at the edges, 6–9 mm. wide, distinctly white owing to a thin covering of fine white meal made up of spherical cells 60–80 μ in diameter, their walls ornamented with numerous minute crystals of calcium oxalate. Stipe very thin, 0·5–0·75 m. wide, 3–4 cm. long, cylindrical, white, smooth, hollow. Gills very narrow, autodigesting only at the edges. Spores brownish under the microscope, oval, 6 × 3·5 μ. Basidia dimorphic, exceedingly small, the long ones about 15 μ in length, each basidium surrounded by not more than four paraphyses, usually by three, and sometimes by only two. Cystidia on the sides of the gills elongated oval, 50–60 × 15–18 μ; cystidia at the edges of the gills connect the gills before the pileus expands.

Frequently occurs in troops on cow dung kept moist for about five weeks in laboratory cultures at Winnipeg.

This fungus has the smallest spores of all known Coprini, and it is the only one in which the long basidia are sometimes surrounded by only two paraphyses. It differs from *C. stercorarius* in being smaller, in having the meal which covers its pileus white instead of grayish, and in having its meal-cells smaller and ornamented with more numerous crystals of calcium oxalate. It is also characterized by expanding conically and shedding its spores only during the night.

Coprinus stellatus Buller, n. sp. Pileus 5–10 mm. high before expansion, 4–5 mm. wide, short-cylindric-conical, sides yellowish-white then bluish-gray as the spores ripen, apex bay-brown, on expanding becoming conic-campanulate and then helmet-shaped with the edge of the pileus curved outward and slightly upward and splitting stellately into some 12–16 rays; covered by numerous simple, pointed hairs 40–50 μ long, projecting 25 μ beyond the palisade cells, the projecting parts 5–10 μ wide, excreting on their sides drops of fluid which glisten in the sunlight and give the pileus a fine-micaceous appearance. Autodigestion of the gills from below upwards is strongly marked, and takes place while adjacent gills are still held together by bridging cystidia; finally the gills and flesh disappear entirely, leaving only a drop of fluid hanging from the persistent brown disc. Stipe of fully expanded fruit-body 4–7 cm. long, tapering slightly upwards, up to 2 mm. thick below, about 1 mm. thick above, tougher than the stipe of *C. curtus*; bay-brown below, whitish upwards, bearing minute white dots consisting of tufts of hairs. Gills less than 0·1 mm. thick (only 0·05–0·06 mm. thick at the level of the paraphyses), 5–7 mm. long, and 1–1·5 mm. wide, white then grayish, becoming entirely destroyed by autodigestion. Disc rather fleshy, brown when moist, persisting alone after the rest of the pileus has become autodigested. Spores elliptical, 8–10 × 4–5 μ, brown under the microscope, with a lighter apical germ-pore. Basidia dimorphic, bodies of the long basidia about

25 μ long, bodies of the short ones about 15 μ. Paraphyses about 20 μ wide and deep, usually four (sometimes five) around each basidium. Cystidia at the edges and scattered fairly uniformly over the sides of the gills, cylindrical, narrow in proportion to their length, 130–170 × 20–26 μ.

Gregarious on horse-dung balls in laboratory cultures at the University of Manitoba, 1911 to 1929.

The species appears to be related to *C. ephemerus* and its varieties, for it has the same kind of hairs on its pileus and it opens and sheds its spores in the night. It is distinguished by its pileus being whitish-brown rather than yellowish-brown at first, in splitting stellately and fairly regularly at the margin as it expands, and in being so strongly autodigestive that at last only the disc is left behind with liquid attached.

Gomphidius gracilis Berk. A slender, umbonate form, probably belonging here, is not uncommon in coniferous woods; Victoria Beach, Minaki; Sept.

— **maculatus** Fr. Victoria Beach, Minaki, Kenora; Aug.–Sept.

— **nigricans** Pk. A species, apparently this one, has been found several times at Kenora; Sept.–Oct.

— **vinicolor** Pk. Coniferous woods, Kenora; Sept.

— **visicidus** Fr. **columbiana** Kauff. Kenora.

Panaeolus campanulatus Fr. On dung, etc.; Victoria Beach, M.A.C.

— **papilionaceus** Fr. Rich soil, M.A.C. Spores 15–17 × 7–9, stem white, but the pileus hygrophanous. Possibly also at Victoria Beach.

— **retirugis** Fr. Common; Kenora, M.A.C., Victoria Beach, etc.

— **solidipes** Pk. On horse dung; Norway House, Winnipeg; July–Aug. Sometimes also in laboratory cultures.

Psathyrella (n) **corrugis** (Pers.) Fr. Kenora; Oct.

— **disseminata** Fr. Not common; M.A.C.; May, June.

PHALLALES

Dictyophora Ravenelii (B. & C.) Burt. Common on old sawdust and waste from sawmills; Minaki, Kenora; Sept.–Oct.

Mutinus caninus (Huds.) Fr. Sent in once from garden soil; Elkhorn; June.

HYMENOGASTRALES

? **Hymenogaster** sp. was dug out of the soil, M.A.C., Sept. 30, 1926.

Rhizopogon rubescens Tul. Several specimens were found at Kenora partly exposed in sandy soil under *Pinus Banksiana*, Oct. 1, 1927.

LYCOPERDALES

Bovista pila B. & C. On the ground; M.A.C., Kenora. Spores 4 μ, without pedicels.

— **plumbea** Pers. In pastures, etc.; M.A.C., Gimli, Kenora. Spores with pedicels.

Calvatia coelata (Bull.) Morg. Gimli.

— **gigantea** (Batsch) Morg. Occasional; Gimli, M.A.C.

— **lilacina** (Fr.) Quel. St. Boniface.

Geaster coronatus Schaeff. A small species found around the base of *Abies balsamea*; Victoria Beach, Kenora.

— **delicatus** Morgan. Recorded from Kenora.

— **fimbriatus** Fr. On ground in deciduous woods; M.A.C.

— **fornicatus** Huds. A specimen, examined by the three authors and almost certainly this species, was found by Mr. C. W. Lowe growing on a boulevard in the centre of Winnipeg.

— **hygrometricus** Pers. Abundant on sand among conifers; Victoria Beach, Kenora.

— **pectinatus** Pers. Occasional amongst balsam fir; Victoria Beach.

— **rufescens** Fr. Deciduous woods; Winnipeg, M.A.C.

— **saccatus** Fr. In woods; M.A.C.

— **triplex** Jungh. Occasional; M.A.C., Indian Bay.

Lycoperdon cepaeforme Bull. M.A.C., Gimli, Norway House, Victoria Beach.

— **gemmatum** Batsch. Common; M.A.C., Victoria Beach, Chater, Kenora, Gimli.

— **piriforme** Schaeff. Common everywhere on dead stumps, trunks, etc.

— **polytrichum** Lloyd. Among moss; Pointe du Bois, M.A.C., Kenora.

— (n) **spadiceum** Pers. Norway House.

— **subpratense** Massee. On log in sand; Victoria Beach.

— **Wrightii** Berk. In a pasture; Gimli.

Mycenastrum corium Desvaux. Occasional among grass; M.A.C.

Secotium agaricoides (Czern.) Hollos. Not uncommon along a grassy roadside at M.A.C.; abundant on disintegrating grass sod, Morden; also at Gimli. Illustrated by Buller (*Researches on Fungi*, vol. 2, fig. 155).

NIDULARIALES

Crucibulum vulgare Tul. Found once at Kenora.

Cyathus stercoreus (Schw.) de Toni. Not uncommon on old dung; M.A.C.

— **striatus** (Huds.) Hoff. Common on old wood; M.A.C., Kenora.

— **vernicosus** (Bull.) DC. (*C. olla* Pers.). Common on soil everywhere.

Nidularia pisiformis (Roth.) Finl. On old wood; Kenora.

SCLERODERMATALES

Sphaerobolus stellatus Tode. On old wood, Kenora; on old cow dung, M.A.C. (*ibid.*, vol. 5, to be published).

Tulostoma albicans White. Rare among grass; M.A.C.

— **campestre** Morgan. On sandy soil; Virden.

— **rufum** Lloyd. Among grass; M.A.C.; Nov. Determined by C. G. Lloyd.

Uncertain

Ptychogaster subiculoides Lloyd (*Mycological Notes* 67, vol. 7, no. 2, pp. 1143–4). This fungus has been collected a number of times, but we do not yet know much about it. Type collected at M.A.C. amongst grass in woods. Chlamydospores not observed by Lloyd or, so far, by ourselves.

FUNGI IMPERFECTI.

HYPHOMYCETES (MONILIALES)[1]

Actinomyces scabies (Thaxt.) Güssow. On potatoes; Norway House and southward.

Alternaria Brassicae (Berk.) Sacc. On turnip; Morden and Brandon. In both localities only the variety "Extra Early Purple Top Milan" was found infected. Spores large, 80–150 × 15–20 μ.

— **Solani** (E. & M.) J. & G. Common, but seldom very injurious, on potato; the same or a similar species on tomato, egg-plant, ornamental Nicotiana, Physalis, Statice, Amaranthus.

Aspergillus fumigatus Fresen. On old leaves; occasionally attacks young chickens.

— **glaucus** (L.) Link. Common as a mold in the herbarium and on moist débris. Sometimes passing into the Eurotium stage.

— **niger** van Tiegh. Has appeared in laboratory cultures.

[1] The Hyphomycetes parasitic on man and the higher animals are given in a separate list at the end of this section.

Bactridium flavum K. & S. Old wood; Victoria Beach. *B. Ellisii* may be a synonym.

Botrytis Allii Munn. Sometimes important as a cause of decay of onions; Winnipeg.

— **cinerea** Pers. Parasitic on lettuce, geranium flowers, strawberry fruits, asparagus, etc.; M.A.C. to Valley River.

— (n) **cinerella** Sacc. & Wint. Old poplar wood; M.A.C.

— (n) **geniculata** Cda. Dead wood; M.A.C.

— **parasitica** Cav. May be the species injurious to lily leaves; Dropmore, Valley River. Spores 12–16 × 10–12 μ.

— **Paeoniae** Oud. Probably the cause of bud rot; M.A.C.

— (n) **phymatotricha** Sacc. On an old board; M.A.C.

— (n) **pilulifera** Sacc. On dung in culture; M.A.C.

— **vulgaris** Fr. (perhaps same as *B. cinerea*). Injuring the tips of sunflowers; M.A.C.

Cephalothecium roseum Cda. Is a very common mold, sometimes semi-parasitic.

Cercoseptoria Lappulae Dearness and Bisby, n. sp. Spots indefinite, affected portions and finally the whole leaf brown. Tubercles or hyphal discs amphigenous, short-celled, hyaline, at first scattered, becoming densely congregated and with the conidia whitening the fruiting area, causing it to appear macroscopically or under a lens like the dense oidium stage of some Erysiphe. Conidia hyaline, straight, continuous to 3-septate, numerous, 50 or more on a disc, detaching in a liquid preparation on a glass slide in a V-shaped fascicle, floating off, and cohering by the mucous covering, 20–90 × 4 μ, the longer ones somewhat thicker at the distal end. Parasitic on leaves and stems of *Lappula Lappula*; Birds Hill, Manitoba; Sept. 16, 1928. *4141* (D. *6729*).

Cercospora altheina Sacc. Common on hollyhock; M.A.C. Spores 40–85 × 4–6 μ.

— **Ampelopsidis** Pk. Abundant on Parthenocissus; M.A.C., Brandon. 40–60 × 4–6.

— **antipus** Ell. & Holw. On Lonicera; Norway House, Birds Hill. 25–40 × 3–4.

— **avicularis** Wint. On Polygonum; St. Lazare, Durban.

— **beticola** Sacc. On beet; M.A.C., Reston, Sifton.

— **Callae** Pk. & Clint. On *C. palustris*; Kenora. 55–66 × 8–10.

— **Comandrae** Ell. & Dearn. On *C. pallida*; Grand Beach. 45–56 × 2–2·5.

— **Davisii** E. & E. On Melilotus; Brandon, Valley River. 34–100 × 3–6.

Cercospora dubia (Riess) Wint. On Chenopodium ; M.A.C. 45–70 × 6–8.

— **Lathyri** Dearn. & House. On *L. venosus* ; Minaki. 30–50 × 4.

— **leptosperma** Pk. (*Cercoseptoria leptosperma* (Pk.) Petrak). On Aralia ; Beausejour. 60–95 × 2–3.

— **malvarum** Sacc. On Malva ; Birds Hill. 60–100 × 4–5.

— **manitobana** Davis. On *Elaeagnus argentea* ; Gilbert Plains. 50–63 × 4–6. A specimen from Killarney has spores 52–80 × 5–8. " Shepherdia " in the original description should read " Elaeagnus " (29).

— **Menispermi** Ell. & Holw. On *M. canadense* ; M.A.C. 40–60 × 5–6.

— **Opuli** (Fckl.) v. Hoehn. On Viburnum ; Gilbert Plains. 35–50 × 2·5–3·5.

— **Osmorrhizae** E. & E. On *O. longistylis* ; M.A.C. 40–80 × 4–5.

— **passaloroides** Wint. On Amorpha ; Birds Hill. 40–52 × 6–8.

— **Rhamni** Fckl. (probably ; resembles *C. aeruginosa* Cke. except in lacking green colour of hyphae). On *R. alnifolia* ; Beulah. 65–100 × 5–6.

— **rhoina** C. & E. On Toxicodendron ; Thunder Hill.

— **rosaecola** Pass. Very common on wild roses.

— (n) **rubigo** Cke. & Hark. On Spiraea ; Minaki. 40–65 × 4–4·5.

— **Sagittariae** E. & K. On *S. latifolia* ; Victoria Beach, Winnipeg. 50–100 × 6–7.

— **squalidula** Pk. On Clematis ; M.A.C. 35–45 × 4–5.

— **subsanguinea** E. & E. On Unifolium and Vagnera ; M.A.C., Treesbank. 20–40 × 3–5.

— **Symphoricarpi** E. & E. On *S. occidentale* ; M.A.C., Carberry. 24–44 × 5–6.

— **umbrata** E. & H. On Bidens ; Victoria Beach. 55–100 × 6.

— **varia** Pk. On Viburnum ; M.A.C. Spores up to 80 × 4.

— **Violae-tricoloris** Briosi & Cav. (probably identical with *C. Violae* Sacc.). On Pansy ; M.A.C.

— **zebrina** Pass. On Trifolium ; M.A.C., Ste. Rose, Norway House. 60–130 × 4–6.

Cercosporella Apocyni (E. & K.) Trel. On Apocynum ; M.A.C., Valley River, Lydiatt, Victoria Beach. 35–80 × 4–5.

— **cana** Sacc. On Aster ; Berens River. 27–37 × 4–5.

Cercosporella Gei Dearness and Bisby, n. sp. Spots pale at first, becoming red-brown, rather darker above, subcircular or irregularly quadrate, with a narrow red border, obscurely concentrically ridged, 3–8 mm. in diameter. Fertile hyphae in tufts, short, narrow, hyaline, on minute tubercles 25–40 µ in diameter, hypophyllous. Conidia hyaline, fasciculate, cylindrical or slightly wider below, closely nucleolate, sometimes 1–3-septate, 28–57 × 2·25–2·75 µ. On living leaves of *Geum strictum*; M.A.C., Winnipeg; July 31, 1926. *2871* (D. *5885*). Collected also at Killarney and Oakville.

Cercosporella Nesliae Dearness and Bisby, n. sp. Spots yellowish-gray, subcircular, 0·5–2 cm. in diameter, bordered by a ridge and sometimes by a darkened diffuse area. Fertile hyphae amphigenous, more abundant below, few to many in a tuberculiform tuft, hyaline, continuous, 10–30 × 2·5–3 µ. Conidia hyaline, straight, seldom curved, mostly continuous, even to slightly obclavate, 30–75 × 2·5–3·5 µ, mostly shorter than 50 µ. Sections from some of the spots might be taken for Ramularia. On living leaves of *Neslia paniculata*; Foxwarren; July 19, 1928. *3991* (D. *6680*). Also collected at Brandon, July 1, 1928.

— **Pastinaceae** Karst. On escaped parsnip; Brandon. 40–60 × 2–4.

Cladosporium (n) **caducum** Davis. On Betula; M.A.C. 14–16 × 6.

— **carpophilum** Thuem. Reported on plums at Morden.

— **cucumerinum** E. & A. Injurious in greenhouse on cucumbers; St. Vital.

— (n) **epimyces** Cke. On old Pleurotus; M.A.C. Spores up to 25 × 6.

— **fulvum** Cke. On tomato; sometimes destructive in greenhouses; Winnipeg. 10–20 × 4–6.

— **graminum** Cda. Common on wheat, rye, and other grasses.

— **herbarum** (Pers.) Lk. Common on moldy bundles of cereals and on other substrata.

— **subsessile** E. & B. On Populus; Norway House, M.A.C. Lydiatt. 13–20 × 5–6.

— **Typhae** Desm. On old *Typha latifolia*; M.A.C. 20–28 × 7–9.

Cladotrichum polysporum Cda. On old wood; M.A.C. 15–17 × 10–11. The mature stage *Chaetosphaeria fusca* not found.

Coniothecium betulinum Cda. Twigs of birch; Indian Bay.

— **effusum** Cda. On old wood; M.A.C. Spores in clumps.

Coremium coprophilum B. & C. On old dung ; M.A.C. 9–10 × 4–5.

Dactylium dendroides (Bull.) Fr. (probably a stage of *Hypomyces rosellus*). On *Polyporus tomentosus* ; Minaki. 30–40 × 10.

Didymaria didyma (Ung.) Schroet. On Anemone ; Morden. 20–23 × 6–8.

Entomosporium maculatum Lév. On Sorbus ; Brandon ; I. L. Conners.

Exosporium Tiliae Link. Abundant on dead Tilia branches ; M.A.C.

Fumago vagans Pers. On honey-dew on leaves ; Dauphin, M.A.C.

Fusarium Betae (Desm.) Sacc. Reported by Henry (*Minn. Tech. Bull.*, 22 : 18, 1924) from soil ; Brandon.

— **caeruleum** (Lib.) Sacc. Commonly causes rot in potato tubers.

— **conglutinans Callistephi** Beach. Destructive to cultivated Asters ; M.A.C. and elsewhere in the Province.

— **culmorum** (W. G. Sm.) Sacc. Occasionally causes wheat scab ; M.A.C.

— **discolor sulphureum** Schl. A fairly common cause of potato rot.

— **graminearum** Schwabe (stage of *Gibberella Saubinetii*). Not uncommon on wheat.

— (n) **lateritium** Nees. On ash twigs ; M.A.C.

— **Lini** Bolley. Often injurious in flax fields.

— **Lycopersici** Sacc. Perhaps the cause of a tomato wilt ; not common.

— **Martii Pisi** F. R. Jones. Common cause of root-rot of peas.

— **moniliforme** Sheld. From Brandon soil ; A. W. Henry (see *F. Betae*).

— **Negundi[nis]** Sherb. Red stain of box-elder, common ; M.A.C.

— **oxysporum** Schl. Frequently causes potato wilt.

— **pyrochroum** (Desm.) Sacc. On Acer twigs ; perhaps also on Salix ; Winnipeg ; M.A.C.

(Fusarium spp. have also been found causing root-rot of soybeans, sweet clover, alfalfa, and oats, and also a rot of lily bulbs.)

Fusicladium depressum (B. & Br.) Sacc. On Sium ; M.A.C. 36–44 × 4–6.

— **dendriticum** (Wallr.) Fckl. Stage of apple scab. Common but not serious ; M.A.C., Morden, Valley River, etc. The Venturia stage not yet detected.

Fusicladium radiosum (Lib.) Lind. (*Napicladium Tremulae*). Often injurious to leaves of *Populus tremuloides*; Norway House, Swan River, M.A.C. 20–30 × 5–8.

Glomerularia Corni Pk. On *Cornus canadensis*; Victoria Beach.

— **Lonicerae** (Pk.) Dearn. & House. On Lonicera; Birds Hill, Portage la Prairie. Spores 4 μ, rough.

Graphium stercorarium March. On horse dung; M.A.C. 5–8 × 3.

Hadrotrichum lineare Pk. (or a variety). On Phragmites; Dauphin.

Harposporium Anguillulae Lohde. This fungus which, so far as we know, has been reported only by Lohde and Zopf in Germany and by Sorokin in Russia, was found in quantity in horse-dung cultures in the laboratory, University of Manitoba. It was killing hundreds of larval nematodes which were swarming on the dung and the sides of the glass container, seven to fourteen days after the fresh dung was placed in the cultures. From the hyphae in the nematodes, basidium-like structures grew outwards and bore the characteristic sickle-shaped conidia.

Helicoma Berkeleyi Curt. Old poplar; M.A.C. Spores 4 μ wide, in coils 20–25 μ wide.

— **polysporum** Morg. Variety on old poplar bark, sometimes abundant; M.A.C. Differs from the type in having a brown rather than a rose colour. Spores in coils 15–18 μ wide.

Helicoon ellipticum (Pk.) Morg. On an old board; M.A.C. Coils 28–32 × 14.

Helicomyces gracilis Morg. On dead poplar; M.A.C. 60–80 × 1–1·5.

Helminthosporium Avenae-sativae (B. & Cav.) Lind. On oats; M.A.C.

— (n) **fusiforme** Cke. On dead oak wood in a hollow trunk; M.A.C. 32–38 × 8–10.

— **gramineum** Rabh. Often injurious to barley.

— **macrocarpon** Grev. (or a variety). On oak branches; M.A.C. 90–120 × 17–18.

— (n) **persistens** Cke. On an old barrel stave; M.A.C. Perhaps a stage of *Pyrenophora rugosa*.

— **sativum** P. K. & B. Very injurious to roots of cereals.

— **teres** Sacc. Not uncommon on barley leaves.

Heterosporium (n) **Avenae** Oud. Associated with "False stripe" on barley leaves; M.A.C. 18–28 × 9–11.

— **gracile** Sacc. (stage of *Didymellina Iridis*). Common on Iris. An examination of the Iris garden at the Morden

Experimental Station on Sept. 8, 1927, showed infection on the following species: flavescens, florentina, pallida, dalmatica, pumila, and sambucina. The following were free from infection at that time: arenaria, cristata, graminea, guldenstaniana, longipetala, lurata, Pseudacorus, ruthenica, setosa, sibirica, spuria, and versicolor. The same or a similar species is sometimes found on leaves of maize.

Heterosporium Phlei Greg. On timothy; M.A.C. Spots rather typical, and a few young echinulate conidia seen.

Hormiscium antiquum (Cda.) Sacc. On ash twigs; M.A.C. Spores *circa* 8 × 6.

Illosporium roseum (Schreb.) Mart. On Peltigera; Gimli. Spores 6–8 μ.

Macrosporium Amaranthi Pk. (probably *Alternaria Solani*). On *A. retroflexus*; Glenboro.

— **commune** Rabh. On seed stalks of onion; M.A.C.

— **cucumerinum** Ell. & Barth. On musk-melon; M.A.C. 50–75 × 18–22.

Microstroma Juglandis (Bereng.) Sacc. On butter-nut; Morden. Some have considered this fungus to belong to the Hymenomycetes, but we consider it to be a Hyphomycete because: (1) the spores are not produced asymmetrically on the ends of the small conical protuberances which terminate the conidiophores; (2) the conical protuberances are not developed to the same degree as are the sterigmata of Basidiomycetes; (3) there is no evidence that the spores are discharged violently with drop excretion; and (4) there is no satisfactory evidence that the nuclei of the mycelium divide conjugately or that two nuclei fuse in the supposed basidium-body.

Mycogone cervina Ditm. On an agaric; M.A.C.

— **ochracea** Bond. On Helvella; M.A.C.

Nigrospora sphaerica (Sacc.) Mason. Rather injurious on ears of maize in storage or field, probably also on old wheat roots; M.A.C. Spores 14–17 μ.

Oedocephalum glomerulosum (Bull.) Sacc. On old sunflower stem; M.A.C. 17–18 × 9–11.

— (n) **hyalinum** (Bon.) Sacc. On dead wood; M.A.C. Spores 4 μ.

Ovularia Carletoni Ell. & Kell. On Lactuca; Virden; W. L. Gordon. 18–20 × 9–10.

— **destructiva** (Phill. & Plowr.) Massee. On Myrica; Minaki. 20–24 × 7–9.

Penicillium brevicaule var. **album.** On Trappist cheese; St. Norbert. *Fide* C. Thom.

Penicillium expansum Link. Common on apple.

Piricularia grisea (Cke.) Sacc. On Chaetochloa, Sorghum; Neepawa, M.A.C.

Polythrincium Trifolii Kze. Common on clovers; Norway House, Valley River, M.A.C.

Ramularia Actaeae Ell. & Holw. On *A. rubra, A. eburnea*; Eden, Norway House. 20–30 × 4–6.

— **anomala** Pk. On Persicaria; M.A.C. Agrees with co-type specimens. 10–16 × 1·5–2.

— **Armoriaceae** Fckl. On horse-radish; Valley River, Carman, Kenora. 16–26 × 2–3.

— **arvensis** Sacc. On Potentilla; Brandon, Valley River, Norway House, M.A.C. 18–32 × 4.

Ramularia coccinea Dearness and Bisby, n. sp. Amphigenous on reddish-gray irregular areas. Fertile hyphae hyaline, in numerous dense tufts, 30 μ high, whitening the spots. Conidia hyaline, cylindrical, continuous to 2-septate, 10–50 × 4–6 μ, mostly about 30 μ long and 1-septate, sometimes catenulate. On living leaves of *Castilleja coccinea*. Between Roblin and Grandview, July 20, 1928. *3976* (D. *6672*). Differs in the spots and in other respects from *R. Castilleiae* E. & E.

— **Celastri** E. & M. On *C. scandens*; M.A.C. 19–23 × 4.

— **cercosporoides** E. & E. On Chamaenerion; Vista, Norway House, Foxwarren. 18–30 × 4–5.

— **cilinodis.** On Tiniaria; Minaki, Pointe du Bois. 20–25 × 3.

— **decipiens** E. & E. On Rumex; Oakville, Dauphin. 16–35 × 3–4.

— **Heraclei** (Oud.) Sacc. On *H. lanatum*; M.A.C., Lydiatt, Dauphin. 23–33 × 4–5.

— **ionophila** Davis. On Viola; Dropmore. 21–33 × 4–5.

— **Lappulae** Davis. On *L. deflexa*; M.A.C., Treesbank. 14–22 × 4.

— (n) **Lysimachiae** Thuem. On Steironema; M.A.C.

— **Magnusiana** (Sacc.) Lindau. On Trientalis; Berens River. Spores 20–26 × 4, 1-septate.

— **Pastinaceae** Bubak. On parsnip; Winnipeg. 22–30 × 3.

— **punctiformis** (Schl.) v. H. On Epilobium; Victoria Beach. *circa* 30 × 3.

— **rosea** Fckl. On Salix; M.A.C., Vista. 15–21 × 3–5.

— **Rudbeckiae** Pk. On *R. laciniata*; Dauphin, Beausejour, Portage la Prairie. 30–47 × 3–5.

— **rufo-maculans** Pk. On Polygonum and Persicaria; M.A.C., Valley River. 10–16 × 2–5.

Ramularia sepium Dearness and Bisby, n. sp. Spots subcircular to angular, 5–8 mm. in diameter, tawny on both sides of leaf, bounded by the veinlets or by a raised border, surrounded in most cases by a narrow translucent rim, bearing at the time of collection rather thickly scattered, epiphyllous pycnidia of a Septoria with spores 28–35 × 1 μ. Fertile hyphae hypophyllous, much branched, hyaline, elongated, 2·75–3 μ wide, septate. Conidia hyaline, single or loosely grouped, catenulate, narrowed distally, one-septate, mostly 15–25 × 3–4 μ. On living leaves of *Convolvulus sepium*, Minaki, Ontario, Sept. 22, 1928. *4077* (D. *6721*). Possibly the same as *Cercospora tuberculella* J. J. Davis, and probably related to the Septoria on the spots.

— **subrufa** Ell. & Holw. On Smilax; M.A.C. 20–25 × 3–4·5.

— **Tanaceti** Lind. On *T. vulgare*; M.A.C. Reported in Colorado. Spores 28–50 × 4–6.

— **Taraxaci** Karst. Very common; Norway House, M.A.C.

— **Tulasnei** Sacc. (stage of *Mycosphaerella Fragariae*). Common; Norway House, Dropmore, M.A.C. 20–45 × 2–4. Hedlund and Lind state that they found this only on hermaphroditic plants, not on female ones.

— **umbrina** Davis. On Diervilla; Ingolf; W. N. Denike. 8–16 × 2–3.

— **Urticae** Ces. On *Urtica gracilis*; M.A.C., Dauphin. 14–28 × 3.

— **Viburni** E. & E. On *V. opulus*; Gilbert Plains. 23–36 × 2·5–3.

— **virgaureae** Thuem. On Solidago; M.A.C., Winnipeg Beach. 22–30 × 3–4.

Rhizoctonia Solani Kuehn. Abundant on potatoes, also on tomatoes, larkspur, candytuft, sweet pea; Norway House southward.

Rhynchosporium Alismatis (Oud.) Davis. On Alisma and Sagittaria; Boissevain, Birds Hill, M.A.C. 14–20 × 3–4.

Sclerotium Delphinii Welsh. Injurious to larkspur; Winnipeg, M.A.C.

Scolecotrichum Clavariarum (Desm.) Sacc. On Clavaria; Kenora. 16–26 × 6–8.

— **graminis** Fckl. On timothy; Gretna; D. L. Bailey. Perhaps common.

Scopularia Populi Dearness and Bisby, n. sp. A brownish-black mold on old bark. Fertile hyphae erect, septate, brown, 0·5–0·6 mm. long, 8–9 μ thick at base, narrowing to

4–5 μ below the penicillately branched or subdendriform, conidiophorous, mucus-covered head. Conidia ovoid, 3–4 × 2 μ. On dead bark of Populus sp., May 23, 1926, M.A.C. *2802* (D. *6095*).

Sepedonium chrysospermum Fr. On Boleti and agarics; M.A.C., Kenora.

Septocylindrium concomitans (E. & H.) Hals. On Bidens; Brandon, M.A.C., Birds Hill. 20–27 × 4–6.

Spondylocladium atrovirens Harz. On potato; M.A.C. Not common.

Sporodesmium compositum B. & C. On twigs of ash and hawthorn; M.A.C. Spores irregular.

Sporotrichum Poae Pk. On old *Poa pratensis*; M.A.C. 14–16 × 4.

Stilbum parvulum C. & E. Old wood; M.A.C. 4 × 1·5.

Stysanus Stemonitis Cda. On decaying potatoes; M.A.C.

Streptothrix fusca Cda. On twigs of (?) Corylus; Minaki. 8 × 5.

Trichoderma lignorum (Tode) Harz. Common on old wood. 3–4.

Trichosporium parasiticum Dearness and Bisby, n. sp. Spots reddish at first then yellowish or arid above, sooty-gray beneath from the colour of the hyphae and spores, yellowish when these are removed, subcircular to angular, 2–5 mm. across. Hyphae hypohyllous, septate, irregularly branched, brown-hyaline, decumbent or ascending, attaining 0·2 mm. in length, 3–7 μ thick. Conidia concolorous, pleurogenous, smooth, elliptic, ovate, or oblong-elliptic, sessile, continuous, 9–14 × 4–6 μ. On living leaves of *Amelanchier alnifolia*; Winnipeg, Aug. 24, 1923. *1725* (D. *5528*). Also collected Sept. 18, 1921.

Trichothecium sublutescens (Pk.) Sacc. (spore adnation not certain). On old wood; M.A.C. 22–32 × 10–16.

Trimmatostroma americanum Thuem. Common on Salix, sometimes on Populus; M.A.C., Valley River, etc. *T. Salicis* Cda., whose spores are smaller and unconstricted, cannot be distinguished in the field. It may also be present.

Tubercularia vulgaris Tode. Common (see *Creonectria purpurea*). 5–9 × 1·5–2.

Verticillium albo-atrum McA. On rotting potato tubers. It has not been found to cause potato wilt in Manitoba.

— **Lactarii** Pk. On Russulae and Lactarii; Victoria Beach, Minaki.

Volutella (n) **ciliata** (A. & S.) Fr. On old ash samarae and débris; M.A.C. 8–12 × 2.

MELANCONIALES

Colletotrichum atramentarium (B. & Br.) Taub. On old potato stems; M.A.C.

— **erumpens** Sacc. Causes considerable injury to rhubarb; Winnipeg, Portage, Morden. 22–26 × 3–5.

— **fusarioides** (E. & K.) O'Gara (*Glomerella cingulata*; see *Mycologia,* 16 : 169). On Asclepias stems; M.A.C. 17·5–35 × 5–6.

— **graminicola** (Ces.) Wils. (*C. cereale* Manns). On Poa and Beckmannia; M.A.C. 22–25 × 4–5.

Colletotrichum Humuli Dearness, n. sp. Spots thickly scattered, visible on both sides of the leaf, small, circular to angular, with a narrow, definite, raised border, usually arid or yellowish, but sometimes brown particularly beneath, 1–4 mm. across, sometimes larger and confluent, becoming brittle and cracking or deciduous. Acervuli numerous, more so above than below, sometimes giving a pink tinge to the spot, nearly superficial, small, 50–110 μ; occasionally furnished with from one to five continuous or septate brown setae 30–55 (120) μ long, tapering upward from 4 μ to 2 μ wide, enlarged at base to 5–7 μ. Conidia hyaline, continuous, oblong, sometimes curved, inequilateral, grumous, sometimes guttulate, 14–21 × 4–6 μ.

On living leaves of *Humulus lupulus.* Manhattan, Kansas, June 1890, May Varney. (Type; D. *6427*).

This description is based on the said type-collection and the collector's description (*ined.*) and Margaret Newton's collection at Brandon, Man., Sept. 1927. Other collections: B. T. Galloway, Garrett Park, Maryland, and D. L. Bailey, M.A.C., Winnipeg.

— **Lindemuthianum** (S. & M.) Br. & Cav. Sometimes injurious to beans; Brandon, Winnipeg.

— **Pisi** Pat. On peas; Brandon; I. L. Conners. This fungus is apparently rare. Our specimens agree with the description given in *Phytopathology,* 11 : 500, except that some of the spores attain 20 × 4 μ. Setae are present.

— **Rudbeckiae** Pk. On *R. laciniata* stems; Carman; W. L. Gordon. 15–25 × 4.

Coryneum Kunzei Cda. On oak twigs; M.A.C. 55–75 × 12–15.

— **pustulatum** Pk. On oak twigs; M.A.C. Spores up to 90 × 15.

Cylindrosporium (n) **Apocyni** E. & E. On *A. cannabinum*; Elma; V. W. Jackson. 52–70 × 2.

Cylindrosporium Artemisiae Dearn. & Barth. On *A. gnaphalodes*; Roblin, Dauphin. 50–70 × 3–4.

— **Clematidis** E. & E. On Clematis; Bethany; R. C. Russell.

— **crescentum** Barth. (*Septogloeum crescentum* (Barth.) Dearn. *in litt.*). On parsnip; Winnipeg. 50–70 × 5–6.

— **Heraclei** E. & E. On *H. lanatum*; Lydiatt, Winnipeg Beach. 40–70 × 3–4.

— **hiemalis** Higg. Common on *Prunus pennsylvanica*; Norway House and southward. 40–66 × 3–4.

— **lutescens** Higg. On *Padus virginiana*; Norway House.

— **prunophorae** Higg. On plum; Morden. 40–55 × 4. According to Higgins the three preceding species mature to Coccomyces spp.

— **salicifolia** (Trel.) Davis. On Spiraea; Neepawa, Berens River. 40–60 × 2·5–3·5.

— **sibiricum** Dearn. & Bisby (*Mycologia,* 20: 245). On Apocynum; Pierson; V. W. Jackson. 22–45 × 2·75–3·25.

— **Thalictri** E. & E. On Thalictrum sp.; Lydiatt. 40–80 × 2–3.

— **Toxicodendri** (Curt.) E. & E. On poison-ivy; Victoria Beach. 40–70 × 3–4.

Gloeosporium Betulae-papyriferae Dearn. & Overh. On birch leaves; Morden, Kenora. 3·5–5 × 1·75–2.

— **Chamaedaphnis** Dearn. On *C. calyculata*; Kenora. 15–18 × 7–8.

— **confluens** Ell. & Dearn. On Sagittaria; M.A.C. 8–12 × 3–4.

— **Coryli** Desm. On *Corylus rostrata*; M.A.C. 14–20 × 5–7.

— **Equiseti** E. & E. On *E. sylvaticum*; Oakville. 35–50 × 3.

— **Polygoni** Dearn. & House. On Tracaulon; Minaki. 4–8 × 2.

— **Psoraleae** Pk. On *P. esculenta*; Camp Hughes; W. L. Gordon. 17–22 × 4–6.

— **Ribis** (Lib.) Mont. & Desm. On *R. odoratum*; M.A.C. 10 × 6.

— **Salicis** West. On willow; Morden. 14–18 × 6–8.

— **sycophilum** Trinch. On Ficus; University of Manitoba; T. C. Vanterpool. 11–16 × 5·5–6·5.

Gloeosporium spadiceum Dearness and Bisby, n. sp. Spots dark-brown, irregularly elliptic, mostly appearing to start at the margin of the leaf and to progress along the veins, 5–10 × 2–4 mm., sometimes spreading over half the leaf. Acervuli deep-seated, sometimes raising the cuticle into a pustule up to 60 μ high before rupturing it, subglobose, 50–140 μ in diameter, opening amphigenously. Conidia hyaline, continuous, cylindrical, 3–8 × 1–2 μ, on long, persistent conidiophores 23–30 × 0·5 μ. Parasitic and injurious to leaves of *Trifolium pratense*; Birds Hill, Sept. 16, 1928, G. R. Bisby, W. F. Hanna, T. Johnson, *3684*, (D. *6474*); also collected at the same location, July 1, 1927.

Gloeosporium tremellinum Sacc. On Acer; Victoria Beach. 3–5 × 1·5–2.

— **venetum** Speg. Sometimes occurs on raspberries, but is not common.

Marssonia Aquilegiae Dearness, n. sp. Spots slate-coloured, grayer or paler in the centre, becoming thin, brittle, fugacious, subcircular, similar but paler below, obscurely concentrically ridged, 0·5–1 cm. Acervuli thickly scattered, nearly concolorous, innate, visible on both sides, probably opening mostly above, 60–200 μ in diameter. Conidia hyaline, cylindric, ends rounded, 1-septate, 9–15 × 4–5 μ.

On living leaves of Aquilegia (cult.). Ithaca, New York, Oct. 7, 1920, S. H. Burnham *352* (D. *5980*; type); Winnipeg, Manitoba, G. R. Bisby *3458*.

— **Castagnei** (D. & M.) Sacc. On poplar, not common; M.A.C.; W. L. Gordon. 17–20 × 4–6.

— **Martini** Sacc. & Ell. On oak; common; M.A.C., Morden, Carberry. 14–24 × 3.

— **Potentillae** (Desm.) Fisch. On wild strawberry; not common; M.A.C.

— **Sonchi** Dearn. & Bisby (*Mycologia*, 20: 243). On sowthistle, common; M.A.C., Minaki, Gladstone. 10–13 × 3–5.

Melanconium cerasinum Pk. On Prunus; M.A.C. 18–21 × 15–17.

— **parvulum** Dearn. & Barth. On Betula; Victoria Beach.

Monochaetia, probably identical with *Pestalozzia insidens* Zabriskie. On elm bark, common; M.A.C. 30 × 9.

— **Kriegeriana** Bres. On Chamaenerion; Roblin; I. L. Conners. 21–26 × 4.

Pestalozzia bicilia Dearness and Bisby, n. sp. Acervuli thickly scattered, black, subcuticular, somewhat pycnidiate, the thin sporogenous layer lining the roof as well as the floor, lenticular, 250–500 μ in horizontal diameter, 150–200 μ measured vertically. Conidia subclavate, biciliate, 4-septate, in water seeming like so many podurid insects, end cells only slightly paler than the three, uniformly pale-brown, intermediate cells, total length 20–27 μ, width 4·5–5·5 μ, intermediate cells each 5–6 μ in length; the two equal divergent setae 10–20 μ long.

On dead stems of *Viburnum Opulus*, Winnipeg, Manitoba (M.A.C.), May 1926, *2557*; April 1927, *3335*. (D. *6301*).

Pestalozzia pezizoides de Not. f. **longiseta** Dearness, new form. On stems of *Symphoricarpos occidentalis*; M.A.C. Some of the setae are 60 μ long or nearly twice the length of the spore body.

Septogloeum Apocyni Pk. (*Stagonospora Apocyni* J. J. Davis, *Parasitic Fungi of Wisconsin*, No. 5, p. 699; *Dearnessia Apocyni* Bubak, *Hedw.*, 58 : 25). A form on *A. sibirica* at Valley River has spores 26–50 × 8–10 μ.

— **Fragariae** (Bri. & Har.) v. H. On Comarum; Norway House. 36–44 × 6–8.

— **rhopaloideum** Dearn. & Bisby (*Mycologia*, 20 : 243). On Populus; common at M.A.C. Spores 40–60 × 8–12 μ, the middle cell largest, 21–30 × 8–12 μ.

SPHAEROPSIDALES

Actinonema Rosae (Lib.) Fr. A stage of Diplocarpon. On roses; Dropmore, Morden. 18–22 × 5–6.

Ascochyta compositarum Davis. On Helianthus; M.A.C. 10–15 × 3–4.

— **graminicola** Sacc. On Agropyron, Panicularia; M.A.C., Bunclody. 18–40 × 3–4.

— **infuscans** E. & E. On Ranunculus; Brandon. 12–17 × 4–5.

— **Medicaginis** Bres. On alfalfa stems; M.A.C. 10–14 × 4–5.

— **Meliloti** (Trel.) Davis (*A. caulicola* Laub.). Common and sometimes injurious on sweet clover. 12–20 × 4–6.

— **parasitica** Fautr. On stems of hollyhock; M.A.C. 9–12 × 3–4.

— **Pisi** Lib. On pea and vetch; Winnipeg, M.A.C. 12–15 × 4–6.

— **Rhei** E. & E. On rhubarb; Lydiatt, M.A.C. 11–20 × 3–5.

— **Thaspii** E. & E. On Zizia; M.A.C. 22–26 × 6–7.

Asteroma Gentianae Fckl. On closed gentian; M.A.C.

Brencklea Sisyrinchii (E. & E.) Petrak. On *S. angustifolium*; Brandon. Spores 18–25 × 3–5 μ, with an awn.

Camarosporium Amorphae Sacc. On *A. fruticosa*; M.A.C. 20–26 × 9–11.

Camarosporium (n) **cruciatum** (Fckl.) Sacc. Pycnidia thickly scattered in the cortex from which small pustules arise and rupture the epidermis revealing the merely punctate black ostiola, 150–170 μ in diameter. Conidia brown, septation mostly cruciform, 6–9 × 5–8 μ. On dead twigs of *Ulmus americana* ; M.A.C.

Camarosporium (n) **Orni** P. Henn. Pycnidia thickly scattered, covered by the epidermis which is ruptured in small circles over the ostiola, hemispheric, firm and black in transection, 175–200 μ in diameter ; ostiola with short papillae or sometimes merely perforate. Conidia dark-brown, oblong with rounded ends, mostly 3-septate with one longitudinal septum, 14–20 × 6–8 μ on hyaline conidiophores 8–15 × 2·5 μ. On dead " water sprouts " of *Fraxinus pennsylvanica* ; M.A.C., Winnipeg.

Catinula turgida (Fr.) Desm. On Corylus ; M.A.C. 20–24 × 8.

Cicinnobolus Cesatii de Bary. On Podosphaera, etc. ; M.A.C., Valley River. Spores sometimes attaining 8 or 9 μ, mostly 4–7 × 2 μ.

Coniothyrium Fuckelii Sacc. (stage of Leptosphaeria). On raspberry ; M.A.C. 2·5–4 × 2–3.

— **olivaceum** Bon. (or one of its varieties). On Vitis ; M.A.C. 5–6 × 2·5–3·5.

— **pyrinum** (Sacc.) Sheld. On apple leaves ; Morden. 5–6 × 3.

— **Tamaricis** Oud. On Tamarix ; M.A.C. 5–7 × 3–4.

Cryptosporiopsis cornina (Pk.) Petr. & Syd. On Cornus ; M.A.C. 30–36 × 10–15.

Cytospora ambiens Sacc. (*Valsa ambiens*). Common. 6–10 × 1·5–2.

— **annulata** E. & E. On *Acer Negundo* ; M.A.C. 5 × 1–1·5.

— (n) **Capreae** Fckl. On Salix twigs ; M.A.C.

— **chrysosperma** Fr. Common and often injurious on poplar ; M.A.C. 4 × 1.

— **Salicis** Rab. On willow, Winnipeg. 5–6·5 × 1.

Darluca filum (Biv.) Cast. Common on Melampsora, Uromyces, Puccinia, but seldom important in checking the development of rusts of economic plants. 12–17 × 4–5.

Dinemasporium Robiniae Ger. Common on old wood ; M.A.C., Indian Bay. 6–8 × 2–3.

Diplodia Amorphae (Wallr.) Sacc. Common on *A. fruticosa* ; M.A.C. 20–27 × 8–11. Possibly a stage of *Cucurbitaria elongata*.

— **Humuli** Fckl. On *H. lupulus* ; M.A.C. 20 × 10.

— **malorum** Fckl. (*Sphaeropsis malorum*). On Prunus ; M.A.C. 20–25 × 10–12.

— **melaena** Lév. On elm twigs ; M.A.C. 20–25 × 9–10.

Diplodia sarmentorum Fr. (may be *D. petiolaris* Pk.). On Menispermum ; M.A.C. 21–26 × 9–12.

— **Zeae** (Schw.) Lév. On overwintered maize stalks ; M.A.C. 24–30 × 6. Parasitic in the corn belt of the U.S.A.

Diplodina Ellisii Sacc. On old Chenopodium ; M.A.C. 16–22 × 7–9.

— **Salicis** West. On dead willow branches ; M.A.C. 15–22 × 3–4.

Discosia artocreas Tode. On old leaves of Rubus and Populus ; M.A.C.

Haplosporella diatrypoides E. & B. On old fungus on wood ; M.A.C.

Hendersonia Mali Thuem. A form on leaves of Amelanchier ; M.A.C. 12–15 × 4–5.

Heteropatella Viburni Dearness and Bisby, n. sp. Pycnidia dark-brown, superficial, patellate or shallow cup-shaped, 0·5–0·7 mm. in diameter at top, 0·75 mm. deep. Conidia hyaline, sub-fusoid, nucleate at each end, 3·5–5 × 2·25–2·5 μ. On compound, dendriform or fasciculate conidiophores forming units about 0·5 mm. long. On dead but firm branches of *Viburnum Opulus* ; Feb. 28, 1928 ; M.A.C. ; W. L. Gordon. *2558* (D. *6521*).

Leptostroma caricinum Fr. On old Carex ; M.A.C. 18–24 × 3.

— **litigiosum** Desm. Common on stipes of Pteritis ; M.A.C. 6–8 × 1·5–2.

Macrophoma Salicis Dearn. & Barth. On willow twigs ; M.A.C. 13–24 × 7–8.

Microdiplodia sp. (probably a stage of *Thyridium ambleium*). On elm ; M.A.C. Spores 7–12 × 4–6 μ. A similar species with spores 8–12 × 4–5 μ is also common on Prunus.

Micropera drupacearum Lév. On Prunus ; M.A.C. 25–50 × 3.

Phleospora Anemones Ell. & Kell. On *A. cylindrica* ; Boissevain. 40–60 × 4–5.

— **canadensis** Bubak & Dearn. On Acer ; Victoria Beach. 35–65 × 2–3.

Phoma berberidella Sacc. & Syd. On barberry ; M.A.C. 4–5 × 2–3.

— **Betae** Fr. Causes rot of beet roots ; M.A.C.

— **Corni-sueciae** (Fr.) Sacc. On Cornus ; M.A.C. 3–4 × 1.

— **destructiva** Plowr. On tomato fruit ; M.A.C. 4–8 × 2–3.

— **fumosa** E. & E. On Acer twigs ; M.A.C. 5 × 3.

— **herbarum** West. On rhubarb ; M.A.C. 4–6 × 2.

Phoma lingam (Tode) Desm. Reported on cauliflower; Winnipeg.

— **longissima** (Pers.) West. On stems of Chenopodium, common; M.A.C.

— **Menispermi** Pk. On dead stems of *M. canadense*; M.A.C. 7–9 × 1·5–2.

— **negundicola** Theum. On samarae of Acer; M.A.C.

— **Pruni** Pk. On Prunus sp.; M.A.C. 6–9 × 2–2½.

Phyllosticta abortiva Ell. & Kell. On Menispermum; M.A.C. Spores 3–4 × 1 μ. Tehon and Daniels (*Mycologia*, 19: 119) contend that this should be called *Phyllosticta menispermicola* T. & D. and that a Septoria on similar spots should be called *S. abortiva* (E. & K.) T. & D.

— **althaeicola** Pass. On hollyhock stems; M.A.C. 5–7 × 2.

— **Antirrhini** Syd. On *A. majus*; M.A.C. 4–6 × 1·5–2.

— **Berberidis** Rabh. On barberry leaves; M.A.C. 4–6 × 2–3.

— **Betae** Oud. On beets and mangels; M.A.C.

— **Betulae** E. & E. On birch leaves; M.A.C. 4–5 × 1.

— **Caricis** (Fckl.) Sacc. On *Carex vesicaria*; Norway House. 5–6 × 2.

— **circumscissa** Cke. On sour cherry; Morden. 4–6 × 1·5–2.

— **Commonsii** E. & E. (*cf. P. baldensis* Massal.). On Paeonia; M.A.C. 4–8 × 2–4.

— **Convallariae** Pers. On Vagnera; M.A.C., Dauphin.

Phyllosticta Corni-canadensis Dearness and Bisby, n. sp. Spots scattered, numerous, small, 1–2 mm. in diameter, white with a purplish-red border, similar but paler below. Pycnidia epiphyllous, black, about 150 μ in diameter, perforate, stoma 15 μ. Conidia hyaline, cylindrical with obtuse rounded ends, somewhat allantoid, minute, 3·5–5 × 0·75 μ. On living leaves of *Cornus canadensis*; Victoria Beach, Manitoba; June 23, 1928. G. R. Bisby, I. L. Conners, and T. Johnson. *4038* (D. *6694*). Pycnidia like *P. Starbackii* Sacc. & Syd., but spots and spores quite different.

— **cornuti** Ell. & Kell. On Asclepias; M.A.C. Spores 3–4 × 1 μ, as given in *N.A. Flora*, 6: 63, but this Phyllosticta may be a microconidial stage of a Cercospora.

— **Crataegi** (Cke.) Sacc. On hawthorn; M.A.C. 3–4 × 1·5.

— **Dearnessii** Sacc. On Rubus; Victoria Beach. 4–5 × 1·5.

— **decidua** Ell. & Kell. On Steironema; M.A.C. 4–6 × 2–3.

— **Dracocephali** Dearn. & Bisby (*Mycologia*, 18: 252). Common and widespread in Manitoba; M.A.C., Roblin, Killarney, Lydiatt. 7–13 × 3·5–4·5.

Phyllosticta Heraclei Ell. & Dearn. On *H. lanatum*; Dauphin. 4–6 × 2.

— **hispida** Ell. & Dearn. On Smilax; M.A.C. 3–4 × 1.

— **innumerabilis** Pk. On Amelanchier and Padus; Minaki, M.A.C., Vista. 5–7 × 1–2.

— **intermixta** Seaver. On poplar leaves; M.A.C. 5–6 × 1–2.

— **ivaecola** E. & E. On Iva; M.A.C., Dauphin. 4–10 × 2–3.

— **Lappae** Sacc. On Arctium; M.A.C.; W. L. Gordon. 6–9 × 3.

— **Lentaginis** Sacc. & Syd. On Viburnum; M.A.C. 4–6 × 3.

— **livida** E. & E. On oak leaves; M.A.C.

— (n) **Lychnidis** K. & S. On *L. chalcedonica*; M.A.C., Brandon. 6–10 × 4. Perhaps *P. Dianthi* West. in part.

— **minima** (B. & C.) E. & E. On Acer; Victoria Beach, Minaki. *Circa* 6 × 2.

— **minutissima** E. & E. On *Acer spicatum*; Minaki. 2–2·5 × 0·5–1.

— **Negundinis** Sacc. & Speg. On Acer; M.A.C. 8–9 × 3–4.

— **phomiformis** Sacc. On oak; Victoria Beach, M.A.C., Carman. 14–22 × 6–9.

— **plantaginicola** Tehon & Daniels. On Plantago; M.A.C., Dunrea, Brandon. 8–14 × 2–4.

— **Rudbeckiae** E. & E. On *R. laciniata*; Dauphin. 5–10 × 2·5–3.

— **smilacina** (Pk.) Dearn. On Smilax; M.A.C.

— **spermoides** Pk. On Vitis and Celastrus; M.A.C. 3–5 × 1.

— **straminella** Bres. On rhubarb; Brandon, M.A.C. 10–20 × 4–5.

— **Tiliae** Sacc. & Speg. On *T. americana*; M.A.C. 3–7 × 2–3.

— **Violae** Desm. On *V. canadensis*; Killarney, Gilbert Plains. 4–8 × 1·5–3.

— **virginiana** (Ell. & Halst.) Seaver. On Padus; M.A.C., Neepawa. 6–8 × 1·5–2.

— **viridis** E. & K. On ash; M.A.C.

— **viticola** (B. & C.) Thuem. On Parthenocissus; Kenora; W. L. Gordon. *Circa* 10 × 6.

Piggotia Fraxini B. & C. Common on ash leaves; M.A.C.

— **Negundinis** Ell. & Dearn. On leaves of Acer; M.A.C. 3–4 × 1.

Placosphaeria punctiformis (Fckl.) Sacc. (stage of Pseudopeziza). On Galium; M.A.C., Birds Hill. 2–3 × 1.

Pyrenochaeta (n) **erysiphoides** Sacc. On Cirsium stems; M.A.C.

Rhabdospora Solidaginis (C. & E.) Sacc. On stems and galls of old goldenrod; Brandon. 22–38 × 2–3.

— **subgrisea** Pk. On stems of Solidago; M.A.C. *Circa* 70 × 2.

Rhabdospora Viburni-Opuli Dearness and Bisby, n. sp. Pycnidia scattered, subcuticular, conic-hemispheric, 175–225 μ in diameter, wall pale, very thin. Conidia hyaline, continuous, non-nucleate, curved or sometimes straight, 20–40 × 1–1·5 μ. Sporiferous layer lining the wall about 15 μ thick. On dead stems of *Viburnum Opulus*, M.A.C., Winnipeg, May 3, 1926, *2725* (D. *6060*). Common and possibly a stage of *Didymella manitobiensis*. *R. interrupta* (B. & C.) Sacc. on this host is described with multinucleate spores 50 μ long; *R. epidermidis* Fautr. has spores 40–60 μ long.

Septoria abortiva (E. & K.) T. & D. (see *Phyllosticta abortiva*). May occur as a distinct species; M.A.C.

— **Aegopodii** Desm. On Osmorrhiza; Winnipeg. Spores 40–65 × 3–4 μ. Pycnidium wall imperfect.

— (n) **Agropyri** E. & E. On *A. tenerum* at Morden, J. C. Dack; and on *A. Richardsonii* at Roblin, I. L. Conners. Spores 37–52 × 2–3 μ. See Weber, *Phytopathology*, 13 : 8.

— **alnifolia** E. & E. On Alnus; Norway House, Valley River, Birds Hill. 40–66 × 2–3.

— **Anemones** Desm. On *A. canadensis*; Brandon. 15–35 × 1–2.

— **Apii** Chester. Often destructive on celery. M.A.C., Miami, Morden.

— **Astragali** Rob. On Lathyrus; Victoria Beach, Minaki, etc. Spores 40–75 × 2–3 μ. *Phleospora reticulata* E. & E. appears to differ only in having spores somewhat thicker and sheathed with mucilage.

— **atropurpurea** Pk. Common on Aster; Minaki, M.A.C., Morden. 60–110 × 2–4.

— **aurea** E. & E. On *Ribes odoratum*; sometimes injurious; M.A.C., Brandon.

— **Avenae** Frank (stage of Leptosphaeria). On oats; Brandon; I. L. Conners. 20–36 × 3–4.

— **bacilligera** Wint. On Ambrosia; M.A.C., Oakville. 24–48 × 1·5–2.

— **Besseyi** Pk. On ash leaves; M.A.C., Sifton. 35–50 × 4–5.

— (n) **betulicola** Pk. On birch; Kenora. 50–65 × 4.

— **Boycei** Dearn. Injurious to birch seedlings; Dropmore. 30–65 × 2.

Septoria Bromi Sacc. On cultivated brome grass ; Napinka. Spores 24–64 × 2 μ, mostly 3-septate. Collected and determined by I. L. Conners.

— **bromigena** Sacc. Is commoner than the preceding, forming coalesced spots turning large areas of the leaf brown. Pycnidia seriate, substomatal, 100–185 × 90–150 μ. Spores falcate, acute, granular, 19–31 × 2·5–3·5. Type from North Dakota ; widespread in Western Canada. (From data by I. L. Conners).

— **Callistephi** Glover. On cultivated Asters ; M.A.C., Brandon. Sometimes injurious. 42–52 × 2–2·5.

— **Cannabis** (Lasch) Sacc. On cultivated hemp ; Morden. 25–40 × 1–1·5.

— (n) **Caricis** Pass. On *C. vesicaria* ; Norway House. 35–40 × 2.

— **chrysanthemella** Sacc. On *C. maximum* ; Morden. 60–90 × 2·5–3.

— **Cirsii** Niessl. On *C. arvense* ; M.A.C. 50–90 × 2·5–3.

— **Clematidis** Rob. On *C. ligusticifolia* ; Morden. 30–75 × 2–3.

— **conspicua** E. & M. Widespread on Steironema. 32–54 × 1–1·5.

— **Convolvuli** Desm. On *C. sepium* ; M.A.C. 38–50 × 1·5–2.

— **Coptidis** B. & C. On *Coptis trifolia* ; Victoria Beach. 18–22 × 1.

— **cornicola** Desm. On *C. stolonifera* ; Dauphin. 32–56 × 2·5–3.

— **corylina** Pk. On hazel ; widespread. 30–50 × 2–3.

— **cucurbitacearum** Sacc. On musk-melon ; M.A.C. 20–30 × 3–4.

— **Diervillae** E. & E. On *D. Diervilla* ; Minaki. 35–45 × 1–1·5.

— **divaricata** E. & E. Sometimes injurious to Phlox ; M.A.C. 16–28 × 1·5.

— **Erigerontis** Pk. On Leptilon ; Brandon, Carberry. 40–60 × 1·5–2.

— **flagellifera** E. & E. On garden pea ; M.A.C. Spores 78–150 × 2·5–3 μ. Type from Brookings, South Dakota and, according to J. J. Davis, a northern species.

— **Galeopsidis** West. On *G. Tetrahit* ; Norway House ; V. W. Jackson. 25–44 × 1–1·5.

Septoria Giliae Dearness and Bisby, n. sp. Spots brown, extending from half the leaf on one side of the midrib to the whole leaf. Pycnidia epiphyllous, black, conspicuous, 150–225 μ, large stoma up to 30 μ across. Conidia continuous, hyaline, 45–70 × 2–3 μ, on conidiophores up to 30 × 1 μ.

On living leaves of *Collomia linearis* at Reston, Manitoba, July 26, 1928, W. L. Gordon, *4042* (D. *6688*).

Septoria (n) **Helenii** E. & E. On *H. autumnale*; M.A.C. 35–50 × 2–2·5.

— **Helianthi** E. & K. On sunflowers; Valley River, M.A.C., Morden. 50–85 × 2–3·5.

— **heterochroa** Desm. (probably same as *S. malvicola*). On Malva; M.A.C., Morden. 35–45 × 2–3.

— **increscens** Pk. On Trientalis; Victoria Beach, Minaki. 20–34 × 1–1·5.

— **Lapparum** Sacc. On Arctium; M.A.C. 19–27 × 1–1·5.

— **lepidiicola** E. & M. On Lepidium; Morden; W. L. Gordon.

— **Liatridis** Ell. & Davis. On Lacinaria; Birds Hill. 60–70 × 2·5–3.

— **Lycopersici** Speg. Often injurious, on tomato; Lydiatt, Winnipeg, Brandon.

— **malvicola** E. & M. On hollyhock; M.A.C. 34–55 × 2–3.

— **menthicola** Sacc. & Lett. On Mentha; M.A.C., Brandon. 30–40 × 2.

— **Mimuli** E. & K. A variety of this, or a distinct species, was obtained on *Mimulus ringens* at Grand Beach, July 23, 1926. Spots red-brown, indefinite, extending over half or all the leaf; pycnidia minute, 50–75 μ; conidia 24–35 × 1–1·25 μ.

— **musiva** Pk. Common and widespread on poplars; doubtless a composite species. 45–65 × 3–4.

— **Nabali** B. & C. On *N. albus*; Woodfield. 26–30 × 1–2.

— **narvisiana** Sacc. On Scirpus; Lake Dauphin. 40–50 × 4.

— **Negundinis** E. & E. On Acer; Stonewall, M.A.C. 40–50 × 3.

— **noctiflorae** E. & K. (not *S. Melandrii* Pass., for the spores are septate). On Lychnis; M.A.C. A somewhat similar species occurs also on Silene and Lychnis, except that the spores are 50–80 × 3 μ, whereas the spores of *S. noctiflorae* are recorded as only up to 36 μ in length.

— **nodorum** Berk. Common, conspicuous, and somewhat injurious on wheat throughout Western Canada. 18–36 × 3–4.

— **Oenotherae** West. On *O. biennis*; Roblin, Gilbert Plains.

Septoria Paeoniae West. var. **berolinensis** Allesch. On Paeonia; M.A.C., Morden, Portage. 24–32 × 2–3.

— **Passerinii** Sacc. On Hordeum, widespread. 22–52 × 2–3.

— **pentstemonicola** E. & E. Spots are indefinite arid areas finally involving the whole leaf. Pycnidia chiefly hypophyllous, 50–100 μ in diameter, wall incomplete (might be mistaken for a Phleospora). Conidia hyaline, continuous, often wider at one end, 30–75 × 2·25–3 μ. On leaves of *Pentstemon acuminatus*, Brandon.

— **Pentstemonis** E. & E. On *P. acuminatus*; Brandon. Spots appear typical, but are sterile.

— **Physostegiae** E. & E. On *P. virginiana*; Winnipeg Beach; W. Popp. 20–30 × 1–1·5.

— **Pisi** West. On garden pea; Brandon. Spots more indefinite than those of *S. flagillifera*. 33–40 × 2·5–3.

— **plantaginea** Pass. (probably var. *Plantaginis-majoris* Sacc.). M.A.C., Oakville. 23–35 × 1–2.

— **Polygonorum** Desm. On Persicaria and Bilderdykia; Gilbert Plains, M.A.C., Kenora. 32–45 × 2.

— **populicola** Pk. On *Populus balsamifera*; Lydiatt. 55–80 × 3–4.

— **psilostega** E. & M. On Galium; M.A.C. 45–60 × 2.

— **Ribis** Desm. (Mycosphaerella stage not found). Common and often injurious.

— **Rubi** West. Widespread but not found to be injurious.

— **Rudbeckiae** Ell. & Hals. On *R. laciniata*; Valley River. 44–56 × 1·5–2.

— **salicina** Pk. On Salix sp.; Norway House. Not mature.

— **sambucina** Pk. On *S. canadensis* and *S. racemosa*; Morden, Portage la Prairie. 40–70 × 3.

— **Scutellariae** Thuem. On *S. lateriflora*; Kenora. 40–70 × 1·5.

— **Secalis** Prill. & Delaer. On rye; M.A.C. 30–40 × 3.

— **Shepherdiae** (Sacc.) Dearness. On Lepargyrea; Birds Hill. Spores 25–50 × 2·5–4 μ. Near Cylindrosporium in that the pycnidium wall becomes obsolete.

— **Sicyi** Pk. On Micrampelis; Sifton, M.A.C., Morris.

— **Sii** Rob. & Desm. On leaves of *S. cicutaefolium*; Oakville; spores 30–40 × 1·5–2 μ. A Septoria on the stems with spores attaining 60 μ in length is probably this species.

— **solidaginicola** Pk. On Oligoneuron (Solidago); M.A.C. 40–65 × 2.

— **Sonchi-arvensis** Dearn. & Bisby (*Mycologia*, 20: 238). Common; M.A.C., Minaki. Spores 20–42 μ long, usually 2·5 μ wide at one end, 1·5 μ at the other.

Septoria sonchifolia Cke. Occasional; M.A.C. Spores short, about 20 μ long.

— **Stachydis** Rob. & Desm. On *S. palustris*; M.A.C. 40–80 × 1·5–2.

— **Stellariae** Rob. & Desm. On *S. media*; Minaki. 55–80 × 1–1·5.

— **Symphoricarpi** E. & E. On *S. occidentalis*; widespread.

— **Thalictri** E. & E. On Thalictrum; Kenora. 50–60 × 1–1·5.

— **Tritici** Desm. Occasionally found on wheat; M.A.C., etc. 45–55 × 2–3.

— **Urticae** Desm. & Rob. On *U. gracilis* and Urticastrum; M.A.C. 40–60 × 1·5–2.

— **Veronicae** Rob. On *V. longifolia*; Morden. 30–50 × 1·5–2.

— **Violae** West. On violet; Killarney, Minaki, Kenora. 20–40 × 1·5–2.

Sphaerographium niveum Dearn. & House. On Ribes stems; M.A.C. Pycnidia all white; spores 50–64 × 2·5–3·5 μ.

Sphaeronema pruinosum Pk. Common on Amelanchier branches; M.A.C. 15–20 × 7–9. (Placed by Petrak in Lagynodella).

Sphaeronemella Helvellae Karst. On *H. infula* and Gyromitra; Victoria Beach, Minaki. Spores continuous, 8–11 × 4 μ.

Sphaeropsis albescens E. & E. On *Acer Negundo*; common and apparently injurious; M.A.C. Spores 16–24 × 10–12 μ. Agrees with co-type from North Dakota.

— **Amorphae** Ell. & Barth. On *A. fruticosa*; M.A.C. 18–26 × 9–11.

— **celastrina** Pk. On *C. scandens*; M.A.C. 21–30 × 9–11.

— **Coryli** E. & E. On hazel branches and twigs; M.A.C. 18–24 × 10.

— **fertilis** Pk. On ash twigs; M.A.C. 23–30 × 10–12.

— **malorum** Pk. On apple twigs, not common on leaves; Physalospora stage not found; M.A.C., Morden. 18–28 × 9–11.

— **Menispermi** Pk. On old stems of *M. canadense*; M.A.C. 20–27 × 9–11.

— **olivacea** Otth. (Melanconiopsis). On Tilia; M.A.C. 20–30 × 10–12.

— **ribicola** C. & E. On twigs of Ribes; M.A.C. 19–26 × 9–11.

— **Syringae** (Fr.) Pk. & Clint. On lilac twigs; M.A.C. 19–24 × 10–12.

Sphaeropsis ulmicola E. & E. On elm twigs; M.A.C. 20–27 × 9–11.

— **vitigena** E. & E. On wild grape twigs; M.A.C. 14–26 × 7–11. *S. fabaeformis* Sacc. is probably the same, and perhaps also *S. viticola* Pass.

— **zonata** Pass. On twigs of Lonicera; M.A.C.; W. L. Gordon. 22–24 × 10–11.

Stagonospora albescens Davis. On Carex; Norway House. 55–65 × 8–10.

— **Amorphae** Dearn. & Bisby (*Mycologia*, 20: 235). M.A.C. 42–56 × 4–6.

— **Atriplicis** (West.) Lind. (with many synonyms). On Blitum and Chenopodium; Valley River, Brandon, Lydiatt, Black Island, Lake Winnipeg. 16–22 × 4–8.

— **Smilacis** (E. & M.) Sacc. On leaves of *S. herbacea*; M.A.C. 13–22 × 4–7.

Vermicularia circinans Berk. On onion, not common; M.A.C.

— **Dematium** (Pers.) Fr. On old herbs; M.A.C. 17–23 × 4.

— **Dematium** var. **samaricola** Sacc. On ash samarae; M.A.C. 16–20 × 4.

— **liliacearum** West. On Smilax leaves; M.A.C.

— **subeffigurata** Ellis. On rhubarb petioles; Winnipeg 20–25 × 4–5.

FUNGI ON MAN AND HIGHER ANIMALS OBSERVED AT WINNIPEG.

By A. M. Davidson.

A large and important group of cutaneous affections are due to fungi and are known as Dermatomycoses. This group includes ringworm, favus, Seborrhoea, Pityriasis, Blastomycosis, and Sporotrichosis.

Ascomycetes

SACCHAROMYCETES (Yeasts)

Saccharomyces cerevisiae Hansen. Causing dermatitis of the hands.

Endomyces albicans Vuillemin. Causing thrush of the mouth.

GYMNOASCACEAE

Microsporon audouini Gruby **Trichophyton megalosporon** Sabouraud	Causing ringworm of the scalp.

Trichophyton acuminatus Bodin	Causing ringworm of the body.
— **violaceum** Bodin	
— **flavum** Fox	
— **felinum** R. Blanchard	
Epidermophyton inguinale Sabouraud	Causing ringworm of the groin known as *Tinea Cruris*.
— **Perneti** Castellani	
— **rubrum** Castellani	
Achorion gypseum Bodin	Causing favus.
— **Schoenleini** Lebert	

ASPERGILLACEAE

Aspergillus malignus Godoelst. Causing otomycosis.

— sp.	Found in the sputum of asthma and tuberculous patients.
Penicillium sp.	

Hyphomycetes

Cryptococcus dermatitis Gilchrist & Stokes. Causing blastomycosis in man.

Monilia sp. Causing paronychia in the finger-nail bed.

Sporotrichum Schenki Hektoon & Perkins. Causing sporotrichosis (ulcers of the skin and inflammation of the joints).

Oospora Bovis Sauvageau & Radais. Causing actinomycosis in cattle and man.

— **minutissima** Sabouraud. Causing erythrasma in the groin.

Melassezia furfur Ch. Robin. Causing pityriasis versicolor on the body.

Pityrosporon Malassezi Sabouraud. Known as the spore of Malassez. Causing pityriasis of the scalp and body.

Dr. Cadham has reported cases of asthma in Manitoba due to the urediniospores of *Puccinia graminis* (50).

XV.

THE LICHENS OF MANITOBA.

BY KIRK SCOTT WRIGHT.[1]

The following is no more than an introduction to the lichen flora of Manitoba as it comprises only 90 species out of a probable 300 or more. No other survey of the lichens of the Province has been made except that of the late John Macoun (19), who recorded 614 species for the whole of Canada, of which 40 were found in Manitoba. Bisby and Buller (29), in 1922, brought together Macoun's Manitoban records. These were principally from the Lake Winnipegosis district, which has never been re-surveyed. The species listed below are those collected by the writer during the four summers of 1925–1928. The localities from which specimens were examined are from the southern, and more especially from the south-eastern, part of Manitoba, except for a few collections brought from Norway House by Dr. Bisby. The vicinity of Indian Bay, which is in Manitoba on the Lake of the Woods at the terminus of the Greater Winnipeg Water District Line, has been surveyed more intensively than any other area. Kenora and Minaki have also been visited, and a record marked " Lake of the Woods " is to be understood to include one or both of these localities and also Indian Bay. Many additional species must occur in the northern part of the Province. Difficult species named here were identified, and practically all were verified, by the late Dr. Bruce Fink of Miami University, Oxford, Ohio, and by his assistant Miss Joyce Hedrick, to both of whom the author is greatly indebted for assistance. The nomenclature used is that of Dr. Fink.

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[1] Mrs. Wright, née Kirk Scott, critically studied the lichens of south-eastern Manitoba during her connection with the Department of Botany of the University of Manitoba. The authors are much indebted to her for contributing this Section. (*Note by the authors.*)

Those interested in the lichens may note that the following ten of the species reported from Manitoba by Macoun have not been found during the course of the present studies :

Arthonia patellulata
A. radiata var. *Swartziana*
Biatorella moriformis
Bilimbia sabuletorum
B. sphaeroides
Collema tenax
Gyalecta lutea
Lecanactis premnea var. *chloroconia*
Nephromium resupinatum
Physcia orbicularis.

These ten species added to eighty in my own List bring the total number of Manitoban lichens up to ninety.

Arthonia lecideela Nyl. Common on the bark of trees such as hawthorn and plum ; Indian Bay to Carberry.

Buellia parasema (Ach.) T. Fries. On bark and dead wood including balsam fir ; Lake of the Woods.

Calicium polyporaeum Nyl. Parasitic on various polypores, especially *Polyporus pargamenus* ; and sometimes on *Daedalea confragosa* ; M.A.C., Norway House.

— **pusillum** (Ach.) Floerke. On oak stump and on conifers ; M.A.C., Norway House.

Catillaria globulosa (Floerke) T. Fries. On bark of trees and on dead wood, e.g. balsam fir ; Victoria Beach.

— **micrococca** (Koerb.) Fink. On bark of tamarack and jack pine ; M.A.C., Indian Bay.

Cetraria aurescens Tuck. On bark of birch and conifers ; Indian Bay.

— **ciliaris** Ach. On twigs and branches of trees, on old wood of tamarack, etc. ; Birds Hill, Lake of the Woods.

— **islandica** (L.) Ach. On prairie ground and stones ; Treesbank.

— **juniperina** (L.) Ach. On twigs and branches of trees and on old logs ; Indian Bay to Birds Hill.

Cladonia alpestris (L.) Rabenh. On earth over rocks, among moss, on sandy soil, and on old wood. Occurs associated with other forms of Cladonia and with *Stereocaulon paschale*. Very common and widely distributed.

— **cariosa** (Ach.) Spreng. On earth or sand, among moss ; Indian Bay.

— **coccifera** (L.) Willd. On earth over rocks, sandy soil, old wood ; not nearly as common as the next species ; Lake of the Woods.

— **cristatella** Tuck. On old wood and earth, among moss over rocks or in swamps, on sandy soil. Very common, usually associated with other species of Cladonia and very often with the moss Polytrichum ; Lake of the Woods.

— **deformis** (L.) Hoffm. On sandy soil, on earth under trees, and on old wood ; Indian Bay to Carberry.

— **degenerans** (Floerke) Spreng. On earth over rocks, under pine trees, on sandy soil ; almost always associated with other species of Cladonia and very often with Polytrichum; Lake of the Woods.

— **fimbriata apolepta** (Ach.) Wainio. On earth, sandy soil, old damp wood ; Indian Bay to Birds Hill.

— **fimbriata simplex** (Weiss) Wainio. On old stumps and logs, in bogs and on wet sandy soil ; Lake of the Woods.

— **furcata paradoxa** (Wainio) Fink. On rocks among moss, on old wood, on earth or sandy soil under trees ; usually associated with other Cladonias ; Lake of the Woods.

— **furcata racemosa** (Hoffm.) Floerke. Among moss over rocks, usually associated with other Cladonias ; Lake of the Woods.

— **gracilis** (L.) Willd. On earth, sandy soil, old wood ; Indian Bay to Winnipeg.

— **gracilis hybrida** Tuck. On earth, sandy soil, old wood ; Lake of the Woods.

Cladonia pyxidata (L.) Hoffm. On earth and old wood; Indian Bay to Birds Hill.

— **rangiferina** (L.) Web. Clustered or almost solitary among other Cladonias, especially *C. alpestris.* On earth over rocks, among moss, or on sandy soil ; common in eastern and northern Manitoba.

— **sylvatica** (L.) Hoffm. Occurs solitary or in clusters associated with other Cladonias ; among moss over rocks.

— **turgida** Hoffm. On earth and on humus over rocks ; Indian Bay.

— **uncialis** (L.) Hoffm. On rocks, associated with other Cladonias, especially *C. furcata racemosa,* and on dry prairie ground ; Treesbank and Lake of the Woods.

— **verticillata** Hoffm. On earth, humus over rocks, sandy soil ; Indian Bay to Carberry.

Dermatocarpon miniatum (L.) E. Fries. On rocks ; Lake of the Woods.

Evernia thamnodes (Flot.) Nyl. Common on branches and trunks of trees, especially conifers, always associated with other lichens such as Parmelia and Usnea ; Lake of the Woods, Treesbank.

Graphis scripta (L.) Ach. On old poplar ; Lake of the Woods.

Gyrophora Dillenii (Tuck.) Arn. On bare exposed rocks ; Lake of the Woods.

— **Muhlenbergii** Ach. On rocks ; Lake of the Woods.

Lecanora Hageni Ach. Occurs commonly on rocks, rarely on wood ; Treesbank.

— **muralis** (Schreb.) Tuck. Very closely attached to rocks ; Treesbank and Lake of the Woods.

— **muralis saxicola** (Poll.) Tuck. On rocks ; Lake of the Woods.

— **rubina** (Lam. & DC.) Ach. On rocks ; Lake of the Woods and Saskatchewan.

— **subfusca** (L.) Ach. On old wood and trunks of trees, rarely on rocks, noted on poplar and oak ; Lake of the Woods.

Lecidea anthracophila Nyl. On burnt or charred wood ; Norway House.

— **granulosa** (Hoffm.) Ach. On bits of cedar and jack pine ; Victoria Beach.

— **parasema** Ach. On bark of trees or old wood, such as oak and poplar ; Victoria Beach.

— **vernalis** (L.) Ach. Occurs over moss at base of trees ; Kenora.

Leptogium tremelloides (L.) S. F. Gray. On rock, near wet places, streams, lake shores, etc. ; Indian Bay.

Parmelia Borreri Turn. On bark of trees, e.g. ash-leaved maple and oak, on moss, over rocks ; Indian Bay.

— **caperata** (L.) Ach. Widespread on trunks and branches of trees in great abundance, rarely on stones and boulders.

— **cetrata** Ach. On trees and old wood ; Indian Bay.

— **conspersa** (Ehrh.) Ach. Very abundant on rocks ; Lake of the Woods.

— **encausta** (Sw.) Nyl. On trees, especially spruce and tamarack ; Lake of the Woods.

— **molliuscula** Ach. On dry prairie ground, stones, and boulders ; Treesbank and Yonker in Saskatchewan.

— **olivacea** (L.) Ach. On branches and trunks of trees including plum and hawthorn ; Indian Bay to Birds Hill.

— **perlata** (L.) Ach. On branches and trunks of old logs in a forest ; Indian Bay.

— **physodes** (L.) Ach. On trees ; Indian Bay.

— **saxatilis** (L.) Ach. On old logs and trunks and branches of trees, especially conifers ; widely distributed.

— **sulcata** Tayl. On trees and fallen logs in forests ; Indian Bay, etc.

— **tiliacea** (Hoffm.) Ach. On trees and rocks ; Lake of the Woods and Birds Hill.

Peltigera aphthosa (L.) Willd. Among moss over rocks, on earth under trees ; Lake of the Woods, Birds Hill.

— **canina** (L.) Hoffm. Among moss on rocks, on earth beneath trees, on sandy soil ; Lake of the Woods and Birds Hill.

— **spuria** (Ach.) Leight. Among moss over rocks, on sandy soil and on old rotten wood ; Indian Bay.

Physcia caesia (Hoffm.) Nyl. On rocks ; Indian Bay.

— **hispida** (Schreb.) Tuck. On trees and rocks ; Indian Bay.

— **obsessa** Mont. On bare exposed rock ; Indian Bay.

— **pulverulenta** (Schreb.) Nyl. On trees and old wood ; Indian Bay, Winnipeg.

— **stellaris** (L.) Nyl. On branches and trunks of trees, sometimes on rock ; very common and widely distributed.

Placodium aurantiacum (Lightf.) Hepp. On trees and rocks ; Lake of the Woods.

— **cerinum** (Hoffm.) Hepp. On trees and old wood, common on poplar bark ; Lake of the Woods, Winnipeg.

— **elegans** (Link.) Ach. On rocks ; Lake of the Woods.

— **vitellinum** (Hoffm.) Hepp. On old wood and rocks ; Indian Bay.

Ramalina calicaris (L.) E. Fries. On trees and old wood, rarely on rocks ; Lake of the Woods to Treesbank.

— **calicaris farinacea** (L.) Nyl. On rocks, rarely on trees ; Indian Bay.

Rhinodina sophodes (Ach.) Koerb. On rocks ; Indian Bay.

— **sophodes confragosa** (Ach.) Tuck. On old wood ; Norway House.

Rhizocarpon petraeum (Wulf.) Koerb. On rocks ; Lake of the Woods.

Stereocaulon paschale (L.) Hoffm. Among moss and on earth over rocks. Usually associated with Cladonia and Peltigera ; Lake of the Woods.

Teloschistes chrysopthalmus (L.) T. Fries. On trees or old wood ; rare ; Lake of the Woods.

— **lychneus** (Ach.) Tuck. On trees, rarely on rocks ; common on oak, poplar, hawthorn, plum ; very rarely in fruit ; Lake of Woods westward.

— **polycarpus** (Hoffm.) Tuck. On trees and old wood ; common and usually associated with *T. lychneus* and *Physcia stellaris* ; Lake of the Woods westward.

Urceolaria scruposa (L.) Nyl. Crusted on rocks ; very common ; Lake of the Woods.

Usnea barbata (L.) E. Fries. On trees and old wood, very rarely on rocks ; common and widely distributed.

— **plicata** (L.) Hoffm. On branches and trunks of trees, especially conifers ; Lake of the Woods, Treesbank.

Xylographa parallela (Ach.) E. Fries. On old dry wood ; Norway House.

XVI.

INDEX OF HOSTS OR SUBSTRATA OF CAULICOLOUS AND LIGNICOLOUS FUNGI.

The Host Index of Parasitic Fungi given in the next Section includes only the leaf parasites of the woody perennials of Manitoba. Some of the fungi found upon twigs, branches, trunks, or roots of trees and shrubs are certainly parasitic, but one must so frequently be uncertain regarding their parasitism that it seems advisable to place all such fungi, along with many saprophytes, in the more general Index of the present Section. An attempt has been made to arrange these fungi in a sort of descending order of parasitism. The letters under which the species are listed have the following meanings :

A : Fungi occurring on partially living twigs, associated with "die back," cankers, or killing of bark tissue ; usually parasites.

B : Fungi on living trunks, usually involving the living wood. Few species included, and those apparently parasitic.

C : Fungi on dead but not decorticated twigs and branches which are attached to the plant or fallen, sometimes doubtless including parasites which were involved in the death of the branches.

D : Fungi on dead bark of old logs, trunks, or larger branches, occasionally on the dead outer bark of living trees. Evidently saprophytes.

E : Saprophytes on old wood, especially fallen logs, but including old stumps, standing dead trunks, chips or fragments of wood, and old decorticated branches. Sometimes fungi such as polypores are included here even though the fruit-bodies appear through the dead bark, because the mycelium is presumed to have grown in the wood below.

F : Saprophytes of fallen catkins, seed-coats, dead seeds or, rarely, fallen leaves.

The fungi found upon roots of perennials have not been included in the Index which follows, because only a few of them, including the ubiquitous *Armillaria mellea*, have been observed.

A fungus may occur upon more than one of the types of substrata, but such a species is included in the Index only once for each host and under the letter of the first of the categories to which it seems to belong.

A few fungi are indexed under names of herbaceous annuals ; these are all examples of saprophytes upon overwintered stems.

A complete record is given of the fungi found associated with poplars, which are predominant trees in the vicinity of the Manitoba Agricultural College where most of the records embodied in this Section were made. With other hosts Myxomycetes, polypores, agarics, or other fungi have seldom been included when they appear to have no specificity in their substratum.

The Index which follows, imperfect as it must necessarily be, may not be much aid in taxonomy, but it is of ecologic interest in that it throws light on the disintegration of the higher plants.

Abies balsamea
- C : Collybia stipitaria
- Dasyscypha Agassizii
- Scoleconectria balsamea
- Tympanis pinastri
- E : Fomes Pini Abietis
- Glonium stellatum

Acer Negundo
- A : Fusarium pyrochroum
- Phoma fumosa
- Sphaeropsis albescens
- C : Cytospora annulata
- Didymella canadensis
- Fenestella phaeospora
- Fomes scutellatus
- Lophiostoma triseptatum
- Schizoxylon compositum
- Teichospora clavispora
- Tubercularia vulgaris
- D : Eutypa ludibunda
- E : Diatrype hochelagae
- Fusarium Negundinis
- Guepinia elegans
- Lophiostoma quadrinucleatum
- Pleurotus elongatipes
- P. septicus
- Polyporus pubescens

Alnus incana
- C : Merulius niveus
- Peniophora aurantiaca
- Polyporus betulinus
- Valsa ambiens
- Valsaria moroides
- E : Bertia moriformis

Amelanchier alnifolia
- C : Calonectria Dearnessii
- Diaporthe binoculata
- Karschia lignyota
- Massaria Pyri
- M. vomitoria
- Pleospora pustulans
- D : Cryptosphaeria fissicola
- Diatrypella quercina
- Sphaeronema pruinosum

Amorpha fruticosa
- A : Camarosporium Amorphae
- Sphaeropsis Amorphao
- Stagonospora Amorphae
- C : Cucurbitaria elongata
- Diaporthe eburensis
- Diplodia Amorphae
- D : Diatrype tumida

Aster spp., old stems
- Leptosphaeria doliolum
- Montagnella Heliopsidis
- Ophiobolus fulgidus
- Phialea cyathoidea

Berberis vulgaris
- A : Phoma berberidella
- C : Cucurbitaria Berberidis

Betula papyrifera
- B : Fomes fomentarius
- C : Coniothecium betulinum
- Diatrype stigma
- Diatrypella decorata
- Melanconium parvulum
- Polyporus betulinus
- Stereum versiforme
- Tubercularia vulgaris
- D : Hypoxylon multiforme
- Hysterium pulicare
- Lachnum bicolor
- Nematelia nucleata
- E : Leicographa franconia
- Lophiosphaeria pulveracea
- Merulius tremellosus
- Panus rudis
- Patellaria atrata
- Pleurotus petaloides
- F : Sclerotinia Betulae

Caragana arborescens (cult.)
- C : Cucurbitaria elongata
- Tubercularia vulgaris

Castilleja coccinea, old stems
- Ophiobolus acuminatus

Carex, old stems
Metasphaoria cumana

Celastrus scandens
A: Sphaeropsis celastrina
Valsa ambiens
C: Creonectria purpurea
Diatrype Celastri
Fomes scutellatus
Hysterium insidens

Chamaenerion angustifolium
Pistillaria typhuloides

Chenopodium album
Diplodina Ellisii
Phoma longissima

Cirsium arvense
Lachnum nidulus
Mollisia atrocinerea
Ophiobolus porphyrogonus
Phialea cyathoidea

Cornus stolonifera
A: Diaporthe albocarnis
Phoma Corni-sueciae
Valsa ambiens
V. cornina
V. coronata
C: Cryptosporiopsis cornina
Dermatea Rubi
Leptosphaeria borealis
L. rugosa
Phialea vulgaris
Pleospora pustulans
D: Hysteropatella Prostii
E: Diaporthe cornicola
Lasiosphaeria canescens
Lophiostoma triseptatum
Patellaria clavispora

Corylus spp.
C: Catinula turgida
Cenangium furfuraceum
Diatrype albopruinosa
Diatrypella verrucaeformis

Corylus spp.—cont.
C: Hypoxylon fuscum
Metasphaeria corylina
Solenia anomala
Sphaeropsis Coryli
Valsa ambiens
V. leucostomoides

Cotoneaster sp. cult.
A: Valsa ambiens
V. leucostoma
C: Polyporus adustus
Tubercularia vulgaris

Crataegus sp.
C: Diaporthe stictostoma
Diatrype stigma
Diatrypella quercina
Dictydiaethalium plumbeum
Schizoxylon compositum
Thyridium canadense
Valsa ambiens
V. leucostoma

Fraxinus pennsylvanica
A: Camarosporium Orni
Fusarium lateritium
Sphaeropsis fertilis
B: Fomes igniarius
C: Curreyella Bisbyii
Eutypella Vitis
Hysterographium Fraxini
Ostropa cinerea
Peniophora incarnata
Valsa fraxinina
D: Cenangium populneum
Nematelia nucleata
E: Dinemasporium Robiniae
Hormiscium antiquum
Hysterographium Mori
Mollisia cinerea
Patellaria atrata
Sporodesmium compositum
F: Vermicularia dematium samaricola
Volutella ciliata

Helianthus annuus
    Lachnella sporotricha
    Leptosphaeria doliolum
    Oedocephalum glomerulosum

Humulus lupulus
    Diplodia Humuli

Lonicera canadensis
  C : Ceriospora manitobiensis
    Pleospora pustulans

Melilotus, old stems
    Ophiobolus porphyrogonus
    Pyrenophora calvescens

Menispermum canadense
    Diplodia sarmentorum
    Phoma Menispermi
    Sphaeropsis Menispermi

Phragmites Phragmites
    Graphyllium manitobiense
    Lophiostoma Arundinis
    Mollisia arundinacea

Picea spp.
  C : Schizoxylon sepincola
  E : Polyporus volvatus
  F : Ciboria rufofusca

Pinus Banksiana
  E : Fomes pinicola
  F : Marasmius androsaceus

Populus spp.[1]
  A : Dichaena Populi
    Cytospora chrysosperma

Populus spp.—cont.
  B : Cenangium populneum
    Fomes igniarius
    F. pinicola (variety)
  C : Didymella canadensis
    Fenestella phaeospora
    Lophiostoma vestitum
    Ostropa cinerea
    Stictis curtispora
    Teichospora pruniformis
    Valsa nivea
    V. translucens
    Favolus canadensis
    Stereum rufum
    Trimmatostroma americana
  D : Perichaena corticalis
    Amphisphaeria bisphaerica
    Eutypa lata
    Hypocrea patella
    Hypoxylon commutatum
    H. Morsei
    Lachnella corticalis
    Melanconis occulta
    Rosellinia parasitica
    Tympanis spermatiospora
    Valsaria insitiva
    Aleurodiscus amorphus
    Calocera cornea
    Corticium arachnoideum
    C. polygonium
    C. radiosum
    Cyphella minutissima
    Eichleriella spinulosa
    Exidia viscosa
    Peniophora affinis
    P. crassa

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[1] Principally *P. tremuloides*. *P. balsamifera* only has been found to bear *Dichaena Populi*, *Fomes pinicola*, and *Phialea amenti*. Old logs and limbs of the two poplars just mentioned are difficult to distinguish. A very few of the collections may have been made upon *Populus deltoides*, but it is believed that most of the fungi reported here, with the three exceptions just mentioned, may grow upon tissues of *P. tremuloides*.

Populus spp.—cont.
D: Stereum fuscum
Helicoma Berkeleyi
H. polysporum
Scopularia Populi
E: Arcyria nutans
Craterium leucocephalum
Hemitrichia clavata
H. vesparium
Physarum connatum
P. contextum
P. maydis
P. nutans
Stemonitis herbatica
Trichia contorta
Amphisphaeria albo-maculans
Ceratostoma brevirostre
Coryne sarcoides
Eutypa Acharii
Hypocrea rufa
Hypoxylon crustaceum
H. rubiginosum
Hysterographium Mori
Lasiosphaeria hirsuta
L. hispida
L. spermoides
Lophiostoma triseptatum
Mollisia cinerea
Nectria Peziza
Patellaria atrata
Propolis faginea
Teichospora populina
T. pygmaea
Clitocybo truncicola
Corticium galactinum
Crepidotus calolepis
C. cinnabarinus
C. fulvo-tomentosus
C. haerens
C. herbarum
C. sepiarius
Dacryomyces minor
Hydnum populinum
Hypochnus ferrugineus
H. umbrinus

Populus spp.—cont.
E: Lentinus sulcatus
L. vulpinus
Merulius lacrymans
Naucoria lignicola
Phlebia strigoso-zonata
Pholiota confragosa
Polyporus adustus
P. arcularius
P. cinnabarinus
P. glomeratus
P. hirsutus
P. subchartaceus
P. velutinus
Poria attenuata
P. purpurea
P. vulgaris
Schizophyllum commune
Stereum fasciatum
S. purpureum
Trametes hispida
Botrytis cinerella
Dinemasporium Robiniae
Heliomyces gracilis
Trichoderma lignorum
F: Phialea amenti
Discosia artocreas

Prunus Besseyi (cult.)
C: Micropera drupacearum
Valsella Laschii

Prunus nigra (cult.)
A: Creonectria purpurea
C: Diaporthe stictostoma
Fomes pomaceus
Micropera drupacearum
Valsa ambiens
E: Polyporus tulipiferus
P. versicolor

Prunus (*Padus*) *nana*
A: Phoma Pruni
Valsa cincta
C: Diatrype albopruinosa
D. stigma
Diatrypella verrucaeformis

Prunus (Padus) nana—cont.
C: Diplodia malorum
Massaria conspurcata
Melanconium cerasinum
Schizoxylon insigne
Sphaeropsis Mali
Thyridium antiquum
D: Exidia glandulosa
Solenia anomala
E: Cenangium populneum prunicolum
Rosellinia ligniaria

Pteritis nodulosa, old fronds
Cyphella capula
Dasyscypha carestiana
Lamproderma scintillans
Leptostroma litigiosum

Pyrus baccata (cult.)
A: Sphaeropsis malorum
C: Diatrype stigma
Diatrypella irregularis
Eutypa ludibunda
Hypoxylon Morsei
Metasphaeria leiostega
Tubercularia vulgaris
Valsa ambiens
E: Polyporus versicolor
Schizophyllum commune

Quercus macrocarpa
C: Coryneum Kunzei
C. pustulatum
Dasyscypha cerina
Diaporthe taleola
Diatrype stigma
Didymosphaeria diplospora
Fenestella amorpha
F. princeps
Helminthosporium macrocarpon
Ostropa cinerea
Teichospora obducens
Valsa ambiens
D: Amphisphaeria applanata

Quercus macrocarpa—cont.
D: Hymenochaete Curtisii
Valsaria insitiva
E: Helminthosporium fusiforme
Hysterographium Mori
Metasphaeria querna
Panus stypticus
Patellea sanguinea
Polyporus brumalis
P. resinosus
Propolis faginea
Rosellinia ligniaria
F: Phialea fructigena
Sclerotinia pseudotuberosa

Ribes spp.
A: Creonectria purpurea
Dothidia ribesia
Sphaeropsis ribicola
C: Metasphaeria leiostega
Sphaerographium niveum
Thyridium antiquum
Thyronectria berolinensis

Rosa spp.
C: Diaporthe tristicha
Didymosphaeria diplospora
Metasphaeria leiostega
Tapesia Rosae
Valsa ambiens

Salix spp.
A: Cytospora Salicis
Fusarium pyrochroum
Valsa boreella
V. pallida
V. translucens
B: Fomes igniarius
C: Chromocrea gelatinosa
Corticium roseum
Cytidia salicina
Diatrype albopruinosa salicina
D. stigma
Diplodina Salicis
Favolus canadensis

Salix spp.—cont.
C: Helotium salicellum
Hysteropatella elliptica
Macrophoma Salicis
Ocellaria ocellata
Ostropa cinerea
Pleospora herbarum
Solenia anomala
Stereum rufum
Teichospora megastega
Trimmatostroma americana
Valsa ambiens
V. salicina
D: Didymella canadensis
Exidia glandulosa
Peniophora cinerea
Stereum versiforme
E: Daedalea confragosa
Eutypa lata
Hypoxylon Morsei
Hysterographium Mori
Lasiosphaeria ovina
Leptosphaeria consimilis
Lophiostoma erosum
L. sexnucleatum
L. triseptatum
Mollisia cinerea
Patellaria atrata
Pezizella viridoflavescens
Polyporus dichrous
Trogia crispa

Solidago, old stems
Ophiobolus fulgidus
Rhabdospora Solidaginis
R. subgrisea

Sonchus arvensis
Leptosphaeria doliolum
L. subconica

Symphoricarpos occidentalis
C: Cryptospora kansensis
Leptosphaeria odora
Pestalozzia pezizoides f. longiseta

Symphoricarpos occidentalis—cont.
C: Rhabdospora Symphoricarpi
Rosellinia parasitica
D: Hymenochaete cinnamonea

Syringa vulgaris
A: Sphaeropsis Syringae

Tilia americana
C: Cyphella Tiliae
Exosporium Tiliae
Fenestella princeps
Massariella Curreyi
Sphaeropsis olivacea
D: Nematelia nucleata
E: Hypoxylon fuscopurpureum
Polyporus tulipiferus
Schizophyllum commune

Triticum aestivum
Chaetomium elatum
Cladosporium herbarum
Leptosphaeria culmicola
Sporobolomyces albus
S. roseus

Ulmus americana
A: Sphaeropsis ulmicola
C: Camarosporium cruciatum
Diplodia melaena
Hysteropatella Prostii
Nummularia repanda
Polyporus conchifer
Thyridium ambleium
Valsa ambiens
D: Monochaetia sp.
Peniophora cinerea
E: Diatrype hochelagae
Lophiostoma triseptatum
Polyporus picipes
P. tulipiferus
Teichospora obducens

Urticastrum divaricatum
Pyrenopeziza compressula

Viburnum Lentago
- C: Cryptosporella Lentaginis
  - Diaporthe Viburni
  - Didymosphaeria epidermidis
  - Eutypa milliaria
  - Fomes conchatus
  - Hysterographium Fraxini
  - Stictis fusca
  - S. radiata

Viburnum Opulus
- A: Rhabdospora Viburni-opuli
- C: Cenangium furfuraceum
  - Diaporthe viburnicola
  - Diatrypella discoidea
  - Didymella manitobiensis
  - Didymosphaeria epidermidis
  - Heteropatella Viburni

Viburnum Opulus—cont.
- C: Hysterographium Fraxini
  - Leptosphaeria borealis
  - Massaria plumigera tetraspora
  - Pestalozzia bicilia
  - Sphaeropsis malorum
  - Stictis fusca
  - S. mollis

Vitis vulpina
- C: Botryosphaeria fuliginosa
  - Coniothyrium olivaceum
  - Lophiostoma triseptatum
  - Sphaeropsis vitigena
- E: Melanopsamma subfasciculata

Zea Mays, old stalks
- Diplodia Zeae
- Gibberella Saubinetii

XVII.

HOST INDEX OF PARASITIC FUNGI.

The List of Fungi given in Section XIV contains references to the host plants, indicated in most cases by the generic name alone or in some cases by the common name. The Host Index given in this Section serves as a record of all the species of plants upon which parasitic fungi have been found in Manitoba. The names of the cultivated hosts, as a rule, are those given in Bailey's *Manual of Cultivated Plants.* Most of the names of the native hosts have been taken from Britton and Brown's *Illustrated Flora of the Northern United States, Canada, and the British Possessions* but, owing to the limitations of this Flora in respect to Manitoba, other names of native plants, of necessity, have been taken from Rydberg's *Flora of the Rocky Mountains and Adjacent Plains.*

Part I. **Parasites of Cultivated Plants.**

Hosts marked "(N.)" are also native as well as cultivated. For fungi attacking twigs or branches of woody plants, see Section XVI.

Acer Ginnala Maxim.
  Rhytisma acerinum
Acer Negundo L. (N.)
  Phyllosticta Negundinis
  Piggotia Negundinis
  Septoria Negundinis
Acer saccharinum L.
  Rhytisma acerinum

Agropyron cristatum Gaertn.
  Claviceps purpurea
  Puccinia graminis

Agropyron tenerum Vasey (N.)
  Claviceps purpurea
  Puccinia Clematidis
  P. graminis
  P. montanensis

- *Agropyron tenerum* Vasey (N.)—cont.
  - Septoria Agropyri
  - Ustilago bromivora
- *Agrostis alba* L. (N.)
  - Erysiphe graminis
  - Puccinia graminis
- *Allium Cepa* L.
  - Botrytis Alii
  - Macrosporium commune
  - Urocystis Cepulae
  - Vermicularia circinans
- *Alopecurus pratensis* L.
  - Puccinia graminis
- *Althaea rosea* Cav.
  - Ascochyta parasitica
  - Cercospora altheina
  - Phyllosticta althaeicola
  - ? Puccinia malvacearum
  - Septoria malvicola
- *Antirrhinum majus* L.
  - Phyllosticta Antirrhini
  - Puccinia Antirrhini
- *Apium graveolens* L.
  - Bacillus carotovorus
  - Septoria Apii
- *Aquilegia canadensis* L. (N.)
  - Marssonia Aquilegiae
- *Asparagus officinalis* L.
  - Botrytis cinerea
  - Puccinia Asparagi
- *Aster Chapmani* Torr. & Gray
  - Septoria atropurpurea
- *Avena sativa* L.
  - Bacterium striafaciens
  - Helminthosporium Avenae-sativae
  - Leptosphaeria avenaria
  - Pseudomonas coronofaciens
  - Puccinia coronata
  - P. graminis
  - Ustilago Avenae
  - U. levis
- *Berberis vulgaris* L.
  - Phyllosticta Berberidis
  - Puccinia graminis
- *Beta vulgaris* L.
  - Cercospora beticola
  - Phyllosticta Betae
  - Phoma Betae
- *Brassica oleracea* var. *botrytis* L.
  - Bacillus oleraceae
  - Phoma lingam
- *Brassica oleracea* var. *capitata* L.
  - Bacillus oleraceae
  - Botrytis cinerea
  - Pseudomonas campestris
  - Sclerotinia sclerotiorum
- *Brassica Rapa* L.
  - Alternaria Brassicae
- *Briza maxima* L.
  - Puccinia graminis
- *Bromus inermis* Leyss.
  - Claviceps purpurea
  - Puccinia Clematidis
  - Septoria Bromi
  - S. bromigena
- *Callistephus chinensis* Nees
  - Coleosporium Solidaginis
  - Fusarium conglutinans Callistephi
  - Septoria Callistephi
- *Cannabis sativa* L.
  - Septoria Cannabis
- *Chrysanthemum maximum* Ram.
  - Septoria chrysanthemella
- *Chrysanthemum morifolium* Ram.
  - Oidium Chrysanthemi
- *Clematis ligusticifolia* Nutt. (N.)
  - Cercospora squalidula
  - Cylindrosporium Clematidis
  - Septoria Clematidis
- *Cucumis Melo* L.
  - Macrosporium cucumerinum
  - Septoria cucurbitacearum
- *Cucumis sativus* L.
  - Bacillus tracheiphilus
  - Cladosporium cucumerinum
  - Pseudomonas lachrymans
  - Sclerotinia sclerotiorum
- *Dactylis glomerata* L.
  - Claviceps purpurea
  - Puccinia graminis

Dahlia pinnata Cav.
  Sclerotinia sclerotiorum

Daucus Carota sativa DC.
  Sclerotinia sclerotiorum

Delphinium cultorum Voss.
  Bacterium Delphinii
  Erysiphe Polygoni
  Rhizoctonia Solani
  Sclerotium Delphinii

Dianthus Caryophyllus L.
  Uromyces caryophyllinus

Fragaria chiloensis Duch.
  Botrytis cinerea
  Ramularia Tulasnei
  Rhizopus nigricans

Fraxinus pennsylvanica Marsh (N.)
  Phyllosticta viridis
  Piggotia Fraxini
  Puccinia fraxinata
  Septoria Besseyi

Gaillardia aristata Pursh
  Entyloma polysporum

Gladiolus spp.
  Bacterium marginatum

Godetia grandiflora Lindl.
  Pucciniastrum Epilobii

Helianthus annuus L.
  Botrytis vulgaris
  Erysiphe Cichoracearum
  Plasmopara Halstedii
  Puccinia Helianthi-mollis
  Sclerotinia sclerotiorum
  Septoria Helianthi

Hibiscus esculentus L.
  Phyllosticta sp.

Holcus Sorghum L.
  Sphacelotheca Sorghi

Holcus Sorghum sudanensis Hitch.
  Bacillus Sorghi
  Piricularia grisea

Hordeum vulgare L.
  Claviceps purpurea
  Erysiphe graminis
  Helminthosporium gramineum

Hordeum vulgare L.—cont.
  Helminthosporium sativum
  H. teres
  Heterosporium Avenae
  Pseudomonas translucens
  Puccinia anomala
  P. graminis
  Septora Passerinii
  Ustilago Hordei
  U. nuda

Iberis amara L.
  Rhizoctonia Solani

Iris spp.
  Bacillus carotovorus
  Heterosporium gracile

Juglans nigra L.
  Microstroma Juglandis

Lactuca sativa L.
  Botrytis cinerea
  Puccinia hieraciata
  Sclerotinia sclerotiorum

Lagurus ovatus L.
  Puccinia graminis

Lathyrus odoratus L.
  Microsphaera diffusa
  Rhizoctonia Solani

Lepidium sativum L.
  Peronospora parasitica

Lilium dauricum Ker.
  Botrytis parasitica

Linum usitatissimum L.
  Fusarium Lini
  Melampsora Lini

Lonicera tatarica L.
  Glomerularia Corni
  Microsphaera Alni Lonicerae

Lychnis chalcedonica L.
  Phyllosticta Lychnidis
  Septoria noctiflorae

Lychnis Haageana Lem.
  Septoria noctiflorae

Lycopersicum esculentum L.
  Alternaria Solani
  Bacterium michiganense
  Cladosporium fulvum

- *Lycopersicum esculentum* L.—cont.
  - Fusarium Lycopersici
  - Phoma destructiva
  - Rhizoctonia Solani
  - Septoria Lycopersici
- *Medicago sativa* L.
  - Ascochyta Medicaginis
  - Peronospora trifoliorum
  - Pleosphaerulina Briosiana
  - Pseudopeziza Medicaginis
  - Pyrenopeziza Medicaginis
  - Sclerotinia sclerotiorum
- *Melilotus alba* Desr.
  - Ascochyta Meliloti
  - Cercospora Davisii
- *Melilotus officinalis* Lam.
  - Ascochyta Meliloti
- *Monarda violacea* (hort.)
  - Puccinia Menthae
- *Nicotiana* (ornamental sp.)
  - Alternaria Solani
- *Paeonia albiflora* Pall.
  - Botrytis Paeoniae
  - Phyllosticta Commonsii
  - Septoria Paeoniae berolinensis
- *Panicum miliaceum* L.
  - Sorosporium Panici-miliacei
- *Pastinaca sativa* L.
  - Botrytis cinerea
  - Cercosporella Pastinaceae
  - Cylindrosporium crescentum
  - Ramularia Pastinaceae
  - Sclerotinia sclerotiorum
- *Pelargonium hortorum* Bailey
  - Bacillus caulivorus
  - Botrytis cinerea
- *Phalaris canariensis* L.
  - Puccinia graminis
- *Phaseolus vulgaris* L.
  - Colletotrichum Lindemuthianum
  - Pseudomonas Phaseoli
- *Phleum pratense* L.
  - Claviceps purpurea
  - Erysiphe graminis
- *Phleum pratense* L.—cont.
  - Heterosporium Phlei
  - Puccinia graminis
  - Scolecotrichum graminis
- *Phlox Drummondii* Hook.
  - Septoria divaricata
- *Picea Abies* Karst.
  - Peridermium coloradense
- *Pisum sativum* L.
  - Ascochyta Pisi
  - Colletotrichum Pisi
  - Erysiphe Polygoni
  - Fusarium Martii Pisi
  - Pseudomonas Pisi
  - Septoria flagellifera
  - S. Pisi
  - Uromyces Fabae
- *Poa pratensis* L.
  - Claviceps purpurea
  - Colletotrichum cereale
  - Erysiphe graminis
  - Puccinia Poarum
  - Sporotrichum Poae
- *Populus* spp.
  - Melampsora Medusae
- *Potentilla fruticosa* L.
  - Phragmidium Andersoni
- *Prunus nigra* Ait.
  - Cladosporium carpophilum
  - Cylindrosporium prunophorae
  - Exoascus Pruni
  - Sclerotinia cinerea
- *Prunus* spp.
  - Exoascus Cerasi
  - Phyllosticta circumscissa
  - Podosphaera Oxyacanthae
- *Pyrus baccata* L.
  - Bacillus amylovorus
  - Coniothyrium pyrinum
  - Penicillium expansum
  - Phyllosticta pirina
  - Sphaeropsis malorum
  - Venturia inaequalis
- *Raphanus sativus* L.
  - Albugo candida
  - Pythium de Baryanum

Rhamnus cathartica L.
  Puccinia coronata

Rheum Rhaponticum L.
  Ascochyta Rhei
  Colletotrichum erumpens
  Phoma herbarum
  Phyllosticta straminella
  Vermicularia subeffigurata

Ribes Grossularia L.
  Puccinia Grossulariae
  Septoria Ribis

Ribes nigrum L.
  Puccinia Grossulariae
  Septoria Ribis
  Sphaerotheca mors-uvae

Ribes odoratum Wendl.
  Gloeosporium Ribis
  Septoria aurea

Ribes sativum Syme
  Septoria Ribis

Roripa Armoracia Hitch.
  Ramularia Armoraciae

Rosa spp.
  Actinonema Rosae
  Earlea speciosa
  Phragmidium disciflorum
  Pseudomonas tumefaciens
  Sphaerotheca Humuli
  S. pannosa

Rubus idaeus L. var. *strigosus* Maxim.
  Asterina rubicola
  Coniothyrium Fuckelii
  Gloeosporium venetum
  Mycosphaerella rubina
  Septoria Rubi
  Sphaerotheca Humuli fuliginea

Salix spp.
  Gloeosporium Salicis
  Melampsora Bigelowii
  Rhytisma salicinum
  Uncinula Salicis

Sambucus canadensis L. (N.)
  Septoria sambucina

Sambucus ? racemosa L.
  Septoria sambucina

Secale cereale L.
  Claviceps purpurea
  Erysiphe graminis
  Pseudomonas translucens Secalis
  Puccinia dispersa
  P. graminis
  Septoria Secalis
  Urocystis occulta

Soja max Piper
  Fusarium sp.
  Pseudomonas glycinea

Solanum Melongena L.
  Alternaria Solani

Solanum tuberosum L.
  Actinomyces scabies
  Alternaria Solani
  Bacillus atrosepticus
  Colletotrichum atramentarium
  Fusarium coeruleum
  F. discolor sulphureum
  F. oxysporium
  Phytophthora infestans
  Rhizoctonia Solani
  Spondylocladium atrovirens
  Stysanus stemonitis
  Verticillium albo-atrum

Spinacea oleracea L.
  Peronospora effusa

Statice latifolia Sm.
  Alternaria Solani

Syringa vulgaris L.
  Microsphaera Alni

Tanacetum vulgare L.
  Ramularia Tanaceti

Tilia americana L. (N.)
  Phyllosticla Tiliae

Trifolium hybridum L.
  Cercospora zebrina
  Polythrincium Trifolii
  Uromyces hybridi

Trifolium medium L.
  Uromyces Trifolii

- *Trifolium pratense* L.
  - Erysiphe Polygoni
  - Gloeosporium spadiceum
  - Pseudopeziza Trifolii
  - Sclerotinia sclerotiorum
  - Uromyces flectens
  - U. Trifolii
- *Trifolium repens* L.
  - Cercospora zebrina
  - Polythrincium Trifolii
  - Uromyces Trifolii-repentis
- *Triticum aestivum* L.
  - Cladosporium graminum
  - Claviceps purpurea
  - Erysiphe graminis
  - Fusarium culmorum
  - F. graminearum
  - Helminthosporium sativum
  - Ophiobolus graminis
  - Pseudomonas atrofaciens
  - P. translucens undulosum
  - Puccinia graminis
  - P. triticina
  - Septoria nodorum
  - S. Tritici
  - Tilletia laevis
  - T. Tritici
  - Ustilago Tritici
- *Triticum dicoccum* Schrank
  - Puccinia graminis
- *Triticum monococcum* L.
  - Puccinia graminis
- *Triticum spelta* L.
  - Puccinia graminis
- *Triticum polonicum* L.
  - Puccinia graminis
- *Ulmus americana* L. (N.)
  - Gnomonia ulmea
- *Veronica longifolia* L.
  - Septoria Veronicae
- *Vicia villosa* Roth
  - Ascochyta Pisi
- *Viola tricolor* var. *hortensis* DC.
  - Cercospora Viola-tricoloris
  - Puccinia Violae
  - Sphaerotheca Humuli-fuliginea
- *Vitis riparia* Michx.
  - Plasmopara viticola
- *Zea Mays* L.
  - Bacillus Sorghi
  - Heterosporium gracile
  - Nigrospora sphaerica
  - Puccinia Sorghi
  - Ustilago Zeae

Part II. **Parasites of Plants growing without Cultivation.**

If the host is cultivated in part or if it is an escape, see Part I. For fungi attacking twigs or branches of woody plants, see Section XVI.

- *Abies balsamea* (L.) Mill.
  - Melampsorella elatina
  - Uredinopsis mirabilis
- *Acer spicatum* Lam.
  - Gloeosporium tremellinum
  - Phleospora canadensis
  - Phyllosticta minima
  - P. minutissima
  - Rhytisma punctatum
  - Uncinula circinata
- *Achillea millefolium* L.
  - Entyloma Achilleae
  - Puccinia millefolii
- *Actaea alba* (L.) Mill.
  - Puccinia Clematidis
- *Actaea eburnea* Rydb.
  - Ramularia Actaeae
- *Actaea rubra* (Ait.) Willd.
  - Puccinia Clematidis
  - Ramularia Actaeae

- *Agastache anethiodora* (Nutt.) Britt.
  - Sphaerotheca Humuli
- *Agrimonia gryposepala* Wallr.
  - Pucciniastrum Agrimoniae
- *Agropyron caninum* (L.) R. & S.
  - Claviceps purpurea
  - Puccinia graminis
- *Agropyron repens* (L.) Beauv.
  - Claviceps purpurea
  - Erysiphe graminis
  - Phyllachora graminis
  - Puccinia graminis
- *Agropyron Richardsonii* Schrad.
  - Claviceps purpurea
  - Puccinia Clematidis
  - P. graminis
  - P. montanensis
  - Septoria Agropyri
- *Agropyron Smithii* Rydb.
  - Ascochyta graminicola
  - Claviceps purpurea
  - Puccinia graminis
  - P. montanensis
- *Agrostis hyemalis* (Walt.) B.S.P.
  - Puccinia graminis
  - P. Liatridis
- *Alisma subcordatum* Raf.
  - Cladochytrium Alismatis
  - Doassansia Alismatis
  - Rhynchosporium Alismatis
- *Alnus incana* (L.) Moench
  - Microsphaera Alni
  - Plasmodiophora Alni
  - Septoria alnifolia
- *Alopecurus aristulatus* Michx.
  - Uromyces Alopecuri
- *Alopecurus pratensis* L.
  - Puccinia graminis
- *Amaranthus retroflexus* L.
  - Albugo Bliti
  - Macrosporium Amaranthi
- *Ambrosia psilostachya* DC.
  - Plasmopara Halstedii
- *Ambrosia trifida* L.
  - Entyloma Compositarum
  - Erysiphe Cichoracearum
  - Puccinia Xanthii
  - Septoria bacilligera
- *Amelanchier alnifolia* Nutt.
  - Apiosporina Collinsii
  - Gymnosporangium clavariforme
  - G. corniculans
  - G. juvenescens
  - Hendersonia Mali
  - Phyllosticta innumerabilis
  - Podosphaera Oxyacanthae
  - Trichosporium parasiticum
- *Amorpha canescens* Pursh
  - Cercospora passaloroides
  - Uropyxis Amorphae
- *Amorpha nana* Nutt.
  - Uropyxis Amorphae
- *Amorpha fruticosa* L.
  - Uropyxis Amorphae
- *Amphicarpa.* See *Falcata.*
- *Andromeda polifolia* L.
  - Rhytisma Andromedae
- *Andropogon furcatus* Muhl.
  - Puccinia Ellisiana
  - Sphacelotheca occidentalis
- *Andropogon provincialis* Lam.
  - Puccinia Ellisiana
- *Anemone canadensis* L.
  - Didymaria didyma
  - Puccinia Clematidis
  - Septoria Anemones
- *Anemone cylindrica* A. Gray
  - Phleospora Anemones
- *Anemone virginiana* L.
  - Puccinia Clematidis
- *Apocynum androsaemifolium* L.
  - Cercosporella Apocyni
- *Apocynum cannabinum* L.
  - Cylindrosporium Apocyni
- *Apocynum sibiricum* Jacq.
  - Cercosporella Apocyni
  - Cylindrosporium sibiricum
  - Septogloeum Apocyni
- *Arabis* sp.
  - Puccinia monoica
- *Aralia nudicaulis* L.
  - Cercospora leptosperma
  - Nyssopsora clavellosa

- *Arctium Lappa* L.
  - Phyllosticta Lappae
  - Septoria lapparum
- *Arctium minus* Schl.
  - Puccinia Bardanae
- *Arctostaphylos Uva-ursi* (L.) Spreng.
  - Exobasidium Vaccinii
- *Argentina anserina* (L.) Rydb.
  - Ramularia arvensis
- *Artemisia gnapholodes* Nutt.
  - Cylindrosporium Artemisiae
  - Puccinia Absinthii
  - P. universalis
- *Asclepias syriaca* L.
  - Colletotrichum fusarioides
  - Phyllosticta cornuti
- *Aster cordifolius* L.
  - Coleosporium Solidaginis
  - Puccinia Asteris
- *Aster laevis* L.
  - Coleosporium Solidaginis
- *Aster Lindleyanus* T. & G.
  - Coleosporium Solidaginis
  - Erysiphe Cichoracearum
  - Puccinia Asterum
  - Septoria atropurpurea
- *Aster multiflorus* Ait.
  - Puccinia Asteris
- *Aster novae-angliae* L.
  - Puccinia Asteris
- *Aster paniculatus* Lam.
  - Coleosporium Solidaginis
- *Aster ptarmicoides* T. & G.
  - Coleosporium Solidaginis
- *Aster salicifolius* Lam.
  - Coleosporium Solidaginis
- *Aster* sp.
  - Cercosporella cana
  - Entyloma compositarum
- *Astragalus ? alpinus* L.
  - Physalosporina megastoma
- *Astragalus carolinianus* L.
  - Peronospora Trifoliorum
- *Avena fatua* L.
  - Puccinia coronata
  - P. graminis
- *Beckmannia crucaeformis* (L.) Host.
  - Colletotrichum graminicola
  - Erysiphe graminis
  - Puccinia graminis
  - P. coronata
  - Ustilago striaeformis
- *Betula papyrifera* Marsh.
  - Gloeosporium Betulae-papyriferae
  - Melampsoridium Betulae
  - Phyllactinia Corylea
  - Phyllosticta Betulae
  - Septoria betulicola
  - S. Boycei
- *Bidens cernua* L.
  - Septocylindrium concomitans
- *Bidens frondosa* L.
  - Cercospora umbrata
  - Plasmopara Halstedii
  - Septocylindrium concomitans
  - Sphaerotheca Humuli fuliginea
- *Bidens vulgata* Greene
  - Septocylindrium concomitans
- *Bilderdykia Convolvulus* (L.) Dum.
  - Puccinia Polygoni-amphibii
  - Septoria Polygonorum
- *Blitum capitatum* L.
  - Stagonospora Atriplicis
- *Bouteloua curtipendula* (Michx.) Torr.
  - Puccinia vexans
- *Brassica juncea* (L.) Cosson
  - Peronospora parasitica
- *Bromus ciliatus* L.
  - Rostrupia tomipara
  - Puccinia coronata

Bromus latiglumis (Shear) Hitch.
Rostrupia tomipara

Bromus purgans L.
Rostrupia tomipara

Bursa Bursa-pastoris (L.) Britt.
Albugo candida
Peronospora parasitica

Calamagrostis canadensis (Michx.) Beauv.
Claviceps purpurea
Puccinia coronata

Calamagrostis elongata (Kear.) Rydb.
Puccinia coronata

Calamovilfa longifolia (Hook.) Hack.
Puccinia amphigena

Calla palustris L.
Cercospora Callae

Caltha palustris L.
Erysiphe Polygoni
Puccinia calthaecola

Capnoides sempervirens (L.) Borck.
Peronospora Corydalis

Carex aquatilis Wahl.
Cintractia Caricis

Carex Douglasii Boot.
Puccinia universalis

Carex durifolia Bailey
Puccinia eminens

Carex praegracilis Boot.
Puccinia universalis

Carex Sartwelli Dewey
Puccinia Peckii

Carex scoparia Schk.
Puccinia Asterum

Carex varia Muhl.
Cintractia Caricis

Carex vesicaria L.
Phyllosticta Caricis
Puccinia urticata
Septoria Caricis
Stagonospora albescens

Carex spp.
Puccinia Grossulariae
P. hieraciata

Castilleja coccinea (L.) Spreng.
Ramularia coccinea

Celastrus scandens L.
Phyllactinia Corylea
Phyllosticta spermoides
Ramularia Celastri

Cerastium vulgatum L.
Melampsorella elatina

Chaetochloa glauca (L.) Scribn.
Ustilago neglecta

Chaetochloa viridis (L.) Scribn.
Piricularia grisea
Sclerospora graminicola

Chamaedaphne calyculata (L.) Moench.
Gloeosporium Chamaedaphnis
Venturia pulchella

Chamaenerion spicatum (Lam.) S. F. Gray
Monochaetia Kriegeriana
Puccinia gigantea
Pucciniastrum Abieti-Chamaenerii
Ramularia cercosporoides
R. punctiformis

Chamaepericlymenum. See Cornus.

Chamaesyce serpyllifolia (Pers.) Small
Uromyces proeminens

Cheirinia cheiranthoides (L.) Link
Peronospora parasitica

Chenopodium album L.
Cercospora dubia
Peronospora effusa
Stagonospora Atriplicis

Chimaphila umbellata (L.) Nutt.
Mycosphaerella Chimaphilae

Cicuta maculata L.
Puccinia Cicutae

- *Circaea alpina* L.
  - Puccinia Circaeae
- *Cirsium arvense* (L.) Scop.
  - Albugo Tragopogonis
  - Pyrenochaete erysiphoides
  - Sclerotinia sclerotiorum
  - Septoria Cirsii
- *Cirsium Flodmanii* (Rydb.) Arth.
  - Puccinia Cirsii
  - Uromyces Junci
- *Cirsium undulatum* (Nutt.) Spreng.
  - Puccinia Cirsii
- *Collomia linearis* Nutt.
  - Phytophthora parasitica
  - Septoria Giliae
- *Comandra livida* Richards
  - Cronartium Comandrae
  - Puccinia Comandrae
- *Comandra pallida* DC.
  - Cercospora Comandrae
  - Cronartium Comandrae
  - Puccinia Andropogonis
- *Comarum palustre* L.
  - Seplogloeum Fragariae
- *Convolvulus sepium* L.
  - Ramularia sepium
  - Puccinia Convolvuli
  - Septoria Convolvuli
- *Coptis trifolia* (L.) Salisb.
  - Septoria Coptidis
- *Cornus canadensis* L.
  - Glomerularia Corni
  - Phyllosticta Corni-canadensis
  - Puccinia porphyrogenita
- *Cornus stolonifera* Michx.
  - Phyllactinia Corylea
  - Septoria cornicola
- *Corylus americana* Walt.
  - Gnomoniella Coryli
  - G. Coryli var. circinata
  - Phyllactinia corylea
  - Septoria corylina
- *Corylus rostrata* Ait.
  - Gloeosporium Coryli
  - Gnomoniella Coryli
  - Microsphaera Alni
- *Crataegus coccinea* Auct.
  - Gymnosporangium germinale
  - Phyllosticta Crataegi
- *Dasystephana Andrewsii* (Griseb.) Small
  - Asteroma Gentianae
- *Diervilla Diervilla* (L.) MacM.
  - Ramularia umbrina
  - Septoria Diervillae
- *Distichlis stricta* (Torr.) Rydb.
  - Puccinia subnitens
- *Doellingeria umbellata* (Mill.) Nees
  - Coleosporium Solidaginis
- *Dracocephalum parviflorum* Nutt.
  - Phyllosticta Dracocephali
- *Elaeagnus argentea* Pursh
  - Cercospora manitobana
  - Puccinia Caricis-Shepherdiae
  - P. coronata
- *Eleocharis* sp.
  - Puccinia Eleocharidis
- *Elymus canadensis* L.
  - Claviceps purpurea
  - Phyllachora graminis
  - Puccinia Clematidis
  - P. graminis
  - P. Impatientis
  - P. montanensis
- *Elymus curvatus* Piper
  - Puccinia Clematidis
  - P. graminis
  - P. montanensis
- *Elymus innovatus* Beal.
  - Claviceps purpurea
- *Elymus jejunus* (Ram.) Rydb.
  - Puccinia Clematidis
  - P. montanensis
- *Elymus Macounii* Vasey
  - Claviceps purpurea
  - Puccinia Clematidis
  - P. graminis

Elymus virginicus L.
  Phyllachora graminis

Epilobium adenocaulon Haussk.
  Pucciniastrum Epilobii
  Ramularia punctiformis

Equisetum sylvaticum L.
  Gloeosporium Equiseti

Eupatorium purpureum L.
  Puccinia Eleocharidis

Falcata comosa (L.) Kuntze
  Erysiphe Polygoni
  Synchytrium decipiens

Festuca elatior L.
  Puccinia graminis

Fragaria americana (Porter) Britt. or
Fragaria canadensis Michx.
  Marssonia Potentillae
  Ramularia Tulasnei
  Sphaerotheca Humuli
  Uncinula parvula

Galeopsis Tetrahit L.
  Septoria Galeropsidis

Galium boreale L.
  Puccinia rubefaciens
  Septoria psilostega

Galium trifidum L.
  Puccinia punctata

Galium triflorum Michx.
  Erysiphe Cichoracearum
  Pseudopeziza repanda
  Puccinia rubefaciens
  P. troglodytes

Gaultheria procumbens L.
  Venturia Gaultheriae

Gentiana acuta Michx.
  Puccinia Haleniae

Geum strictum Soland.
  Cercosporella Gei
  Sphaerotheca Humuli

Glycyrrhiza lepidota Nutt.
  Erysiphe Polygoni
  Uromyces Glycyrrhizae

Grindelia squarrosa (Pursh) Dunal.
  Puccinia Asterum

Grossularia Cynosbati (L.) Mill.
  Puccinia Grossulariae

Grossularia hirtella (Michx.) Spach.
  Plasmopara ribicola

Hedysarum boreale Nutt.
  Uromyces Hedysari-obscuri

Helenium autumnale L.
  Septoria Helenii

Helianthus divaricatus L.
  Erysiphe Cichoracearum

Helianthus Maximiliani Schrad.
  Plasmopara Halstedii
  Puccinia Helianthi

Helianthus petiolaris Nutt.
  Plasmopara Halstedii
  Septoria Helianthi
  Uromyces Junci

Helianthus tuberosus L.
  Ascochyta compositarum
  Sclerotinia sclerotiorum

Heracleum lanatum Michx.
  Cylindrosporium Heraclei
  Phyllachora Heraclei
  Phyllosticta Heraclei
  Ramularia Heraclei
  Septoria Heraclei

Heuchera Richardsonii R. Br.
  Puccinia Heucherae

Hieracium canadense Michx.
  Puccinia hieraciata

Hieracium scabriusculum Schwein.
  Puccinia Hieracii

Hordeum jubatum L.
  Erysiphe graminis
  Puccinia Clematidis
  P. graminis
  P. Impatientis
  Septoria Passerinii
  Ustilago Lorentziana

Humulus lupulus L.
  Colletotrichum Humuli
  Pseudoperonospora Humuli
  Sphaerotheca Humuli

- *Impatiens biflora* Walt.
  - Plasmopara obducens
  - Puccinia Impatientis
- *Iris versicolor* L.
  - Puccinia Majanthae
- *Iva xanthifolia* Nutt.
  - Basidiophora Kellermanii
  - Phyllosticta ivaecola
  - Sclerotinia sclerotiorum
  - Septoria ivaecola
- *Juncus balticus* Willd.
  - Uromyces Junci
- *Juncus Dudleyi* Wieg.
  - Uromyces Junci
- *Juncus filiformis* L.
  - Uromyces Junci
- *Juniperus sibirica* Burgsd.
  - Gymnosporangium germinale
- *Koeleria gracilis* Pers.
  - Puccinia graminis
- *Lacinaria scariosa* (L.) Hill
  - Puccinia Liatridis
  - Septoria Liatridis
- *Lactuca pulchella* (Pursh) DC.
  - Bremia lactucae
  - Ovularia Carltoni
  - Puccinia hemisphaerica
  - P. hieraciata
- *Lappula deflexa* (Wahl.) Garcke
  - Erysiphe Cichoracearum
  - Ramularia Lappulae
- *Lappula Lappula* (L.) Karst.
  - Cercoseptoria Lappulae
- *Lathyrus ochroleucus* Hook.
  - Uromyces Fabae
- *Lathyrus venosus* Muhl.
  - Cercospora Lathyri
  - Erysiphe Polygoni
  - Microsphaera diffusa
  - Septoria Astragali
  - Uromyces Fabae
- *Ledum groenlandicum* Oeder.
  - Melampsoropsis abietina
  - M. ledicola
- *Leontodon Taraxacum* L.
  - Puccinia Hieracii
  - Ramularia Taraxaci
  - Sphaerotheca Humuli fuliginea
- *Lepargyrea canadensis* (L.) Greene
  - Puccinia Caricis-Shepherdiae
  - Septoria Shepherdiae
  - Sphaerotheca Humuli fuliginea
- *Lepidium densiflorum* Schrad.
  - Albugo candida
  - Peronospora parasitica
  - Septoria lepidiicola
- *Leptilon canadense* (L.) Britton
  - Septoria Erigerontis
- *Linnaea borealis* var. *americana* (Forbes) Rehder
  - Halbaniella Linnaeae
  - Venturia Dickei
- *Linum Lewisii* Pursh
  - Melampsora Lini
- *Lonicera canadensis* Marsh
  - Glomerularia Lonicerae
- *Lonicera glaucescens* Rydb.
  - Cercospora antipus
- *Lonicera Sullivantii* A. Gray
  - Cercospora antipus
  - Microsphaera Alni Lonicerae
- *Lygodesmia juncea* (Pursh) Don
  - Puccinia Grindeliae
- *Malva rotundifolia* L.
  - Cercospora malvarum
  - Puccinia malvacearum
  - Septoria heterochroa
- *Malvastrum coccineum* (Nutt.) Gray
  - Puccinia Sherardiana
- *Menispermum canadense* L.
  - Cercospora Menispermi
  - Entyloma Menispermi
  - Phyllosticta abortiva
  - Septoria abortiva

Mentha glabrior (Hook.) Rydb.
  Erysiphe Cichoracearum
  Puccinia angustata
  P. Menthae
  Septoria menthicola

Menyanthes trifoliata L.
  Physoderma Menyanthes

Merolix serrulata (Nutt.) Walp.
  Puccinia Peckii

Micrampelis lobata (Michx.) Greene
  Septoria Sicyi

Mimulus ringens L.
  Septoria Mimuli

Mitella nuda L.
  Puccinia Heucherae

Moldavica. See *Dracocephalum.*

Monarda fistulosa L.
  Puccinia Menthae

Monarda mollis L.
  Puccinia Menthae

Monolepis Nuttalliana (Schultes) Engelm.
  Albugo Bliti

Muhlenbergia mexicana (L.) Trin.
  Phyllachora graminis

Myrica gale L.
  Cronartium Comptoniae
  Ovularia destructiva

Nabalus albus (L.) Hook.
  Puccinia hieraciata
  Septoria Nabali

Naumbergia thyrsiflora (L.) Duby.
  Puccinia lysimachiata

Neslia paniculata (L.) Desv.
  Albugo candida
  Cercosporella Nesliae

Norta altissima (L.) Britt.
  Albugo candida

Oenothera biennis L.
  Peronospora Arthuri
  Puccinia Peckii
  Septoria Oenotherae

Oligoneuron canescens Rydb.
  Puccinia Asterum
  Septoria solidaginicola

Onosmodium occidentale McK.
  Puccinia apocrypta

Osmorrhiza longistylis (Torr.) DC.
  Cercospora Osmorrhizae
  Puccinia Pimpinellae
  Septoria Aegopodii

Oxytropis sp.
  Uromyces punctatus

Padus virginiana (L.) Mill.
  Cylindrosporium lutescens
  Phyllosticta innumerabilis
  P. virginiana
  Podosphaera Oxyacanthae

Panicularia grandis (Wats.) Nash
  Ascochyta graminicola
  Claviceps purpurea

Panicum capillare L.
  Phyllachora graminis

Parthenocissus quinquefolia (L.) Planc.
  Cercospora Ampelopsidis
  Phyllosticta viticola
  Uncinula necator

Pentstemon acuminatus Dougl.
  Puccinia Andropogonis
  Septoria pentstemonicola
  S. Pentstemonis

Persicaria Hartwrightii (Gray) Greene
  Puccinia Polygoni-amphibii

Persicaria Muhlenbergii (Meisn.) Small
  Puccinia Polygoni-amphibii
  Ramularia anomala
  R. rufomaculans

Persicaria Persicaria (L.) Small
  Septoria Polygonorum

Petalostemon candidus (Willd.) Michx.
  Aecidium Onobrychidis
  Synchytrium aureum

Phalaris arundinacea L.
Claviceps purpurea
Puccinia graminis
P. Majanthae

Phragmites Phragmites (L.) Karst.
Hadrotrichum lineare
Puccinia Magnusianum
P. rubella
Ustilago grandis

Physalis heterophylla Nees
Puccinia Physalidis

Physalis lanceolata Michx.
Alternaria Solani
Entyloma australe

Physalis virginiana Mill.
Puccinia Physalidis

Physostegia virginiana (L.) Benth.
Septoria Physostegiae

Picea canadensis (Mill.) B.S.P.
Peridermium coloradense

Picea Mariana (Mill.) B.S.P.
Melampsoropsis abietina
M. ledicola

Pinus Banksiana Lamb
Coleosporium Solidaginis
Cronartium Comptoniae
Hypodermella ampla
Lophodermium Pinastri

Pinus sp.
Cronartium quercuum

Plantago major L.
Erysiphe Cichoracearum
Peronospora alta
Phyllosticta plantaginicola
Septoria plantaginea

Poa arida Vasey
Puccinia Clematidis

Poa crocata Michx.
Erysiphe graminis

Poa triflora Gilib.
Erysiphe graminis

Polygala Senega L.
Aecidium polygalinum

Polygonum amphibium L.
Puccinia Polygoni-amphibii

Polygonum aviculare L.
Cercospora avicularis
Erysiphe Polygoni
Uromyces Polygoni

Polygonum erectum L.
Ramularia rufomaculans
Uromyces Polygoni

Populus balsamifera L.
Marssonia Castagnei
Septoria musiva
S. populicola
Uncinula Salicis

Populus deltoides Marsh.
Melampsora Medusae

Populus tremuloides Michx.
Cladosporium subsessile
Fusicladium radiosum
Phyllosticta intermixta
Septogloeum rhopaloideum
Septoria musiva
Uncinula Salicis

Portulaca oleracea L.
Albugo Portulaceae

Potentilla bipinnatifida Dougl.
Mollisia Dehnii
Phragmidium Potentillae

Potentilla glabrella Rydb.
Phragmidium Potentillae

Potentilla monspeliensis L.
Mollisia Dehnii
Ramularia arvensis

Potentilla pennsylvanica L.
Phragmidium Potentillae

Potentilla sp.
Phragmidium Ivesiae

Prunus Besseyi Bailey
Exoascus Cerasi

Prunus pennsylvanica
Cylindrosporium hiemalis

Psoralea esculenta Pursh
Gloeosporium Psoraleae

- *Pulsatilla ludoviciana* (Nutt.) Heller
  - Polythelis suffusea
  - Urocystis Anemones
- *Ptcris aquilina* L.
  - Cryptomyces Pteridis
- *Pteritis nodulosa* (Michx.) Nieuw.
  - Uredinopsis Struthiopteridis
- *Pyrola americana* Sweet
  - Melampsoropsis Pyrolae
  - Pucciniastrum Pyrolao
- *Pyrola asarifolia* Michx.
  - Melampsoropsis Pyrolae
- *Quercus macrocarpa* Michx.
  - Marssonia Martini
  - Microsphaera calocladophora
  - Phyllosticta livida
  - P. phomiformis
  - Taphrina coerulescens
- *Radicula palustris* (L.) Moench
  - Albugo candida
- *Ranunculus abortivus* L.
  - Ascochyta infuscans
  - Uromyces Alopecuri
- *Ranunculus delphinifolius* Torr.
  - Doassansia ranunculina
- *Ranunculus Macounii* Brit.
  - Entyloma Ranunculi
  - Uromyces Alopecuri
- *Ranunculus sceleratus* L.
  - Uromyces Alopecuri
- *Rhamnus alnifolia* L'Her.
  - Cercospora Rhamni
  - Puccinia coronata
- *Rhus glabra* L.
  - Sphaerotheca Humuli
- *Ribes americanum* Mill.
  - Puccinia Grossulariae
  - Sphaerotheca mors-uvae
- *Ribes triste* Pall.
  - Puccinia Ribis
- *Rosa acicularis* Lindl.
  - Phragmidium Rosae-acicularis
- *Rosa blanda* Ait.
  - Cercospora rosaecola
  - Earlea speciosa
  - Phragmidium montivagum
  - Sphaerotheca Humuli
- *Rubus arcticus* L.
  - Pucciniastrum arcticum
  - Sphacrotheca Humuli
- *Rubus pubescens* Raf.
  - Gymnoconia interstitialis
  - Phyllosticta Dearnessii
  - Pucciniastrum arcticum
  - Septoria Rubi
- *Rubus strigosus* Michx.
  - Didymosphaeria manitobiensis
  - Phragmidium imitans
- *Rudbeckia ampla* A. Nels.
  - Colletotrichum Rudbeckiae
  - Erysiphe Cichoracearum
  - Phyllosticta Rudbeckiae
  - Plasmopara Halstedii
  - Ramularia Rudbeckiae
  - Septoria Rudbeckiae
  - Uromyces perigynius
  - U. Rudbeckiae
- *Rumex crispus* L.
  - Ramularia decipiens
- *Rumex mexicanus* Miesn.
  - Puccinia ornata
  - P. rubella
- *Rumex occidentalis* S. Wats.
  - Puccinia rubella
- *Rumex venosus* Pursh
  - Ramularia decipiens
- *Sabina horizontalis* (Moench) Rydb.
  - Gymnosporangium corniculans
  - G. juvenescens
- *Sagittaria latifolia* Willd.
  - Cercospora Sagittariae
  - Doassansia deformans
  - D. furva
  - D. intermedia
  - Gloeosporium confluens
  - Rhynchosporium Alismatis

- *Salix cordata* Muhl.
  - Melampsora Humboldtiana
- *Salix* spp.
  - Melampsora Bigelowii
  - Ramularia rosea
  - Rhytisma salicinum
  - Septoria salicina
  - Uncinula Salicis
- *Sanicula marylandica* L.
  - Puccinia marylandica
- *Schizachyrium scoparium* (Michx.) Nash
  - Puccinia Andropogonis
- *Scirpus atrovirens* Muhl.
  - Puccinia angustata
- *Scirpus cyperinus* (L.) Kunth
  - Puccinia angustata
- *Scirpus microcarpus* Presl
  - Puccinia angustata
- *Scirpus validus* Vahl
  - Septoria narvisiana
  - Uromyces Scirpi
- *Scolochloa festucacea* (Willd.) Link
  - Claviceps purpurea
  - Puccinia coronata
- *Scutellaria lateriflora* L.
  - Septoria Scutellariae
- *Sibbaldiopsis tridentata* (Soland.) Rydb.
  - Phragmidium Potentillae
- *Sieversia ciliata* (Pursh) G. Don.
  - Peronospora Potentillae
- *Sinapis arvensis* L.
  - Albugo candida
- *Sisyrinchium angustifolium* Miller
  - Brencklea Sisyrinchii
- *Sium cicutaefolium* Gmel.
  - Fusicladium depressum
  - Septoria Sii
- *Smilax herbacea* L.
  - Metasphaeria Dearnessii
  - Phyllosticta hispida
  - P. smilacina
- *Smilax herbacea* L.—cont.
  - Puccinia amphigena
  - Ramularia subrufa
  - Stagonospora Smilacis
  - Vermicularia Liliacearum
- *Solanum triflorum* Nutt.
  - Entyloma australe
- *Solidago canadensis* L.
  - Coleosporium Solidaginis
- *Solidago gilvocanescens* (Rydb.) Smyth
  - Coleosporium Solidaginis
  - Ramularia virgaureae
- *Solidago nemoralis* Ait.
  - Puccinia Asterum
- *Solidago serotina* Ait.
  - Coleosporium Solidaginis
  - Puccinia Asterum
- *Sonchus arvensis* L.
  - Marssonia Sonchi
  - Sclerotinia sclerotiorum
  - Septoria Sonchi-arvensis
  - S. sonchifolia
- *Sorbus scopulina* Greene
  - Entomosporium maculatum
  - Gymnosporangium cornutum
- *Spartina gracilis* Trin.
  - Puccinia Distichlidis
- *Spartina pectinata* Bosc.
  - Claviceps purpurea
  - Puccinia Distichlidis
  - Uromyces acuminatus
- *Spiraea alba* Du Roi
  - Cercospora rubigo
  - Cylindrosporium salicifolia
- *Spirodela polyrhiza* (L.) Schleiden
  - Tracya Lemnae
- *Sporobolus cryptandrus* (Torr.) A. Gray
  - Puccinia graminis

Stachys palustris L.
Erysiphe Galeopsidis
Septoria Stachydis

Steironema ciliatum (L.) Raf.
Phyllosticta decidua
Puccinia Distichlidis
Ramularia Lysimachiae
Septoria conspicua

Stellaria media (L.) Vill.
Septoria Stellariae

Stipa comata Trin. & Rup.
Puccinia Stipae

Stipa spartea Trin.
Puccinia Stipae

Stipa viridula Trin.
Claviceps purpurea
Puccinia substerilis
Ustilago hypodytes

Symphoricarpos occidentalis Hook.
Cercospora Symphoricarpi
Microsphaera Symphoricarpi
Puccinia abundans
Septoria Symphoricarpi

Thalictrum dasycarpum Fisch. & All.
Erysiphe Polygoni
Puccinia Clematidis

Thalictrum dioicum L.
Entyloma Thalictri
Erysiphe Polygoni
Mycosphaerella Thalictri
Phytophthora Thalictri

Thalictrum venulosum Trel.
Polythelis Thalictri
Puccinia clematidis

Thalictrum spp.
Cylindrosporium Thalictri
Septoria Thalictri

Tiniaria cilinodis (Michx.) Small
Ramularia cilinodis
Ustilago anomala

Torrcsia odorata (L.) Hitch.
Puccinia graminis

Toxicodendron radicans (L.) Kze.
Cercospora rhoina
Cylindrosporium Toxicodendri
Pileolaria Toxicodendri

Tracaulon sagittatum (L.) Small
Gloeosporium Polygoni

Trientalis americana Pursh
Ramularia Magnusiana
Septoria increscens

Trisetum spicatum (L.) Richt.
Puccinia monoica

Unifolium canadense (Desf.) Greene
Cercospora subsanguinea
Puccinia Majanthae

Urtica gracilis Ait.
Puccinia urticata
Ramularia Urticae

Urtica Lyallii S. Wats.
Puccinia urticata

Urticastrum divaricatum (L.) Kze.
Septoria Urticae

Vaccinium canadense Richards.
Venturia compacta

Vaccinium spp.
Calyptospora columnaris
Exobasidium Vaccinii

Vagnera stellata (L.) Morong
Cercospora subsanguinea
Phyllosticta Convallariae
Puccinia Majanthae

Viburnum Lentago L.
Microsphaera Alni

Viburnum Opulus L.
Cercospora Opuli
Plasmopara Viburni
Ramularia Viburni

Viburnum pauciflorum Pylaie
Puccinia Linkii

Viburnum pubescens (Ait.) Pursh
Cercospora varia
Phyllosticta Lentaginis

- *Vicia americana* Muhl.
  - Peronospora Viciae
  - Uromyces Fabae
  - U. porosus
- *Viola adunca* J. E. Smith
  - Puccinia Violae
- *Viola canadensis* L.
  - Phyllosticta Violae
  - Puccinia Violae
  - Septoria Violae
- *Viola pedatifida* G. Don.
  - Puccinia Violae
- *Viola* spp.
  - Puccinia Ellisiana
  - Ramularia ionophila
- *Vitis vulpina* L.
  - Phyllosticta spermoides
- *Xanthium* sp.
  - Puccinia Xanthii
- *Zizia aurea* (L.) Koch
  - Ascochyta Thaspii
  - Puccinia Angelicae

XVIII.

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In naming species, the monographs of Lister and Macbride have been followed for the Myxomycetes and, for the fungi generally, much use has been made of Rabenhorst's *Kryptogamen-Flora* and of Engler and Prantl's *Die Natürlichen Pflanzenfamilien.* Saccardo's *Sylloge Fungorum* has been consulted frequently. Peck's New York State *Reports*, the *North American Flora* published by the New York Botanical Garden, Dr. J. J. Davis' lists of *Parasitic Fungi of Wisconsin*, and C. G. Lloyd's *Mycological Notes* and monographs, each and all have been of much assistance. Seaver's *Cup-fungi* appeared just in time to permit of a rearrangement of the operculate Pezizales in accordance with his nomenclature. Ellis and Everhart's *North American Pyrenomycetes* describes the majority of Manitoban fungi belonging to this class. The monographs by Burt (13), Coker (10), Coker and Couch (11), and Overholts (12) have been regarded as authoritative for the families with which they deal.

Descriptions of some of the species were found in various other books, pamphlets, and periodicals.

The list of books and papers which have special reference to the fungi of Manitoba and which were published prior to January 1, 1929, has been made as complete as possible.

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XIX

INDEX OF CLASSES, ORDERS, FAMILIES, AND GENERA.

Acanthostigma, 70
Achorion, 146
Actinomyces, 122
Actinonema, 135
Aecidium, 82
Agaricaccae, 10, 12, 13, 16, 18, 47, 98
Agaricales, 88
Albugo, 55
Aleuria, 59
Aleurina, 59
Aleurodiscus, 88
Alternaria, 122
Amanita, 32, 38, 48, 98
Amanitopsis, 98
Amphisphaeria, 71
Amphisphaeriaceae, 71
Anellaria, 25, 115
Anthostoma, 76
Apiosporina, 66
Arcyria, 51
Armillaria, 98, 154
Arthonia, 148
Ascobolus, 25, 30, 59
Ascochyta, 135
ASCOMYCETES, 9, 25, 35, 44, 57
Ascophanus, 25, 59
Aspergillales, 66
Aspergillus, 123, 146
Asterina, 66
Asteroma, 135
Auricularia, 87
Auriculariales, 87

Bacillus, 54
BACTERIA, 25, 43, 54
Bacterium, 54
Bactridium, 123
Badhamia, 22, 51
BASIDIOMYCETES, 10, 17, 45, 80
Basidiophora, 55
Bertia, 90
Bertiella, 70
Biatorella, 148
Bilimbia, 148
Bolbitius, 25, 108
Boletaceac, 46, 97
Boletinus, 97
Boletus, 20, 97
Botryosphaeria, 79
Botrytis, 25, 123
Bovista, 121
Bremia, 55
Brencklea, 135
Buellia, 148
Bulgaria, 59

Calicium, 148
Calocera, 92
Calonectria, 22, 67
Calvatia, 121

Calyptospora, 82
Camarosporium, 135
Cantharellus, 98
Catillaria, 149
Catinella, 61
Catinula, 136
Cenangium, 61
Cephalothecium, 123
Ceratiomyxa, 51
Ceratostoma, 71
Ceratostomataceae, 71
Cercoseptoria, 123
Cercospora, 123
Cercosporella, 124
Ceriospora, 72
Cetraria, 149
Chaetocladium, 22, 56
Chaetomiaceae, 25, 69
Chaetomium, 69
Chaetosphaeria, 70
Chlorosplenium, 61
Chondromyces, 24, 51
Chromocrea, 67
Chytridiales, 55
Ciboria, 62
Cicinnobolus, 22, 136
Cintractia, 81
Cladochytrium, 55
Cladonia, 149
Cladosporium, 125
Cladotrichum, 125
Claudopus, 30, 106
Clavaria, 30, 92
Clavariaceae, 46, 92
Claviceps, 67
Clitocybe, 99
Clitopilus, 107
Coleosporium, 82
Collema, 148
Colletotrichum, 132
Collybia, 21, 32, 99
Comatrichia, 51
Coniophora, 88
Coniothecium, 125
Coniothyrium, 136
Coprinus, 25, 31, 115
Cordyceps, 23, 68
Coremium, 25, 126
Corticium, 89
Cortinarius, 20, 30, 108
Coryne, 62
Coryneum, 132
Craterellus, 89
Craterium, 24, 51
Creonectria, 68
Crepidotus, 30, 110
Cronartium, 82
Crucibulum, 121
Cryptococcus, 146
Cryptomyces, 63
Cryptosphaeria, 78
Cryptospora, 78
Cryptosporella, 78
Cryptosporiopsis, 136
Cucurbitaria, 71
Cucurbitariaceae, 71
Cudonia, 58
Curreyella, 69
Cyathus, 25, 122
Cylindrosporium, 132
Cyphella, 89
Cytidia, 89
Cytospora, 136

Dacryomyces, 88
Dacryomycetales, 88
Dactylium, 126
Daedalea, 22, 93
Daldinia, 79
Darluca, 22, 136
Dasyscypha, 62
Delitschia, 27, 30, 69

Dermatea, 62
Dermatocarpon, 150
Diaporthe, 76
Diatrypaceae, 78
Diatrype, 78
Diatrypella, 79
Dibotryon, 69
Dichaea, 51
Dichaena, 64
Dictydiaethalium, 51
Dictydium, 51
Dictyophora, 49, 120
Dictyostelium, 24, 51
Diderma, 52
Didymaria, 126
Didymella, 73
Didymium, 24, 52
Didymosphaeria, 38, 73
Dinemasporium, 136
Diplodia, 30, 136
Diplodina, 137
Discina, 59
Discosia, 137
Doassansia, 81
Dothidea, 69
Dothidiales, 44, 69

Earlea, 82
Eccilia, 107
Eichleriella, 87
Eleutheromyces, 22, 68
Empusa, 23, 57
Endomyces, 145
Enerthenema, 42
Enteridium, 52
Entoloma, 107
Entomophthora, 23, 57
Entomosporium, 126
Entyloma, 31, 81
Epichloe, 68
Epidermophyton, 146
Erysiphe, 66
Eurotium, 66
Eutypa, 77
Eutypella, 77
Evernia, 150
Exidia, 88
Exoascus, 57
Exobasidiales, 88
Exobasidium, 88
Exosporium, 126

Favolus, 94
Fenestella, 77
Fimetaria, 26, 70
Flammula, 110
Fomes, 21, 31, 94
Fuligo, 52
Fumago, 126
FUNGI IMPERFECTI, 10, 16, 49, 122
Fusarium, 126
Fusicladium, 126

Galera, 25, 110
Geaster, 121
Geopyxis, 59, 62
Gibberella, 30, 68
Gloeosporium, 133
Glomerularia, 127
Glonium, 65
Gnomonia, 76
Gnomoniaceae, 76
Gnomoniella, 76
Gomphidius, 120
Grandinia, 92
Graphis, 150
Graphium, 25, 127
Graphyllium, 65
Guepinia, 88
Gyalecta, 148
Gymnoascus, 25, 66

Gymnoconia, 82
Gymnosporangium, 82
Gyromitra, 58
Gyrophora, 150

Hadrotrichum, 127
Halbaniella, 66
Haplosporella, 137
Harposporium, 31, 137
Hebeloma, 111
Helicoma, 127
Helicoon, 127
Heliomyces, 127
Helminthosporium, 127
Helotium, 62
Helvella, 30, 58
Helvellales, 10, 13, 58
Hemitrichia, 52
Hendersonia, 137
Heteropatella, 137
Heterosporium, 127
Hormiscium, 128
Humarina, 59
Hydnaceae, 46, 92
Hydnum, 92
Hygrophorus, 31, 100
Hymenochaete, 89
Hymenogaster, 120
Hymenogastrales, 49, 120
Hypholoma, 113
Hyphomycetes, 10, 49, 122
Hypochnus, 90
Hypocrea, 22, 68
Hypocreales, 44, 67
Hypodermella, 65
Hypomyces, 22, 68
Hypoxylon, 79
Hysteriales, 44, 64
Hysterium, 65
Hysterographium, 65
Hysteropatella, 62

Illosporium, 23, 128
Inocybe, 49, 111

Karschia, 62

Laboulbenia, 45, 80
Laboulbeniales, 80
Laccaria, 102
Lachnella, 62
Lachnum, 62
Lactarius, 102
Lamproderma, 52
Lamprospora, 59
Lasiobolus, 25, 59
Lasiosphaeria, 70
Lecanactis, 148
Lecanora, 150
Lecidia, 150
Leicographa, 62
Lentinus, 103
Lenzites, 94
Leocarpus, 52
Leotia, 58
Lepiota, 103
Leptogium, 151
Leptonia, 107
Leptosphaeria, 73
Leptostroma, 137
Licea, 24, 52
LICHENS, 22, 147
Lophiosphaeria, 72
Lophiostoma, 72
Lophiostomataceae, 72
Lophium, 65
Lophodermium, 66
Lycogala, 53
Lycoperdales, 49, 121
Lycoperdon, 121

Macrophoma, 137
Macrosporium, 128

Marasmius, 103
Margarita, 42
Marssonia, 134
Massaria, 75
Massariaceae, 75
Massariella, 76
Melampsora, 83
Melampsorella, 83
Melampsoridium, 83
Melampsoropsis, 83
Melanconiales, 10, 13, 49, 132
Melanconidiaceae, 78
Melanconis, 78
Melanconium, 134
Melanomma, 71
Melanopsamma, 71
Melanospora, 22, 68
Melassezia, 146
Melastiza, 59
Melogrammataceae, 79
Merulius, 94
Metasphaeria, 74
Microdiplodia, 137
Micropera, 137
Microsphaeria, 67
Microsporon, 145
Microstroma, 128
Mitrula, 58
Mollisia, 62
Monascus, 57
Moniliales, 122
Monochaetia, 134
Montagnella, 69
Morchella, 21, 58
Mucilago, 53
Mucor, 26, 56
Mucorales, 25, 56
Mucronella, 93
Mutinus, 120
Mycena, 103
Mycenastrum, 121
Mycogone, 22, 128
Mycosphaerella, 72
Mycosphaerellaceae, 72
Mytilidion, 66
Myxobacteriaceae, 24, 51
MYXOMYCETES, 9, 13, 16, 24, 41, 51

Naematelia, 88
Naucoria, 112
Nectria, 22, 68
Nephromium, 148
Nidularia, 122
Nidulariales, 49, 121
Nigrospora, 128
Nolanea, 107
Nummularia, 80
Nyssopsora, 83

Ocellaria, 63
Odontia, 93
Oedocephalum, 128
Oidium, 67
Oligonema, 53
Omphalia, 104
Onygena, 66
Oospora, 146
Ophiobolus, 74
Ostropa, 63
Otthia, 71
Ovularia, 128

Panaeolus, 25, 120
Panus, 104
Parmelia, 151
Patella, 59
Patellaria, 62
Patellea, 25, 63
Paxillus, 112
Paxina, 60
Peckiella, 22, 68

Peltigera, 151
Penicillium, 128, 146
Peniophora, 90
Perichaena, 53
Peridermium, 83
Perisporiales, 44, 66
Peronospora, 14, 55
Peronosporales, 9, 14, 29, 43, 55
Perrotia, 60
Pestalozzia, 134
Peziza, 25, 60
Pezizales : 10, 13, 16, 21, 59, 180
  Inoperculateae, 61
  Operculatae, 59
Pezizella, 63
Phacidiales, 44, 63
Phallales, 49, 120
Phialea, 63
Phlebia, 93
Phleospora, 137
Pholiota, 112
Phoma, 137
Phragmidium, 83
Phycomyces, 27, 56
PHYCOMYCETES, 9, 43, 55
Phyllachora, 69
Phyllactinia, 67
Phyllosticta, 138
Physalosporina, 75
Physarella, 53
Physarum, 30, 53
Physcia, 148, 151
Physoderma, 55
Phytophthora, 14, 19, 56
Piggotia, 139
Pileolaria, 83
Pilobolus, 25, 56
Piptocephalus, 22, 56
Piricularia, 129
Pistillaria, 92
Pityrosporon, 146
Placodium, 151
Placosphaeria, 139
Plasmodiophora, 51
Plasmopara, 19, 21, 56
Plectania, 30, 32, 60
Pleomassaria, 76
Pleosphaerulina, 72
Pleospora, 75
Pleosporaceae, 72
Pleurage, 26, 70
Pleurotus, 30, 104
Pluteolus, 25, 113
Pluteus, 108
Podosphaera, 67
Polyporaceae, 16, 46, 93
Polyporus, 21, 30, 94
Polythelis, 83
Polythrincium, 129
Poria, 96
Propolis, 63
Protodiscales, 10, 57
Protomycetales, 44, 57
Psalliota, 21, 114
Psathyra, 114
Psathyrella, 120
Pseudomonas, 54
Pseudoperonospora, 14, 30, 56
Pseudopeziza, 63
Pseudoplectania, 60
Psilocybe, 25, 114
Psilopezia, 60
Pterula, 92
Ptychogaster, 122
Puccinia, 17, 19, 21, 30, 32, 38, 83, 146
Pucciniastrum, 86
Pyrenochaeta, 139
Pyrenopeziza, 63
Pyrenophora, 75

Pyronema, 25, 60
Pythium, 56

Radulum, 93
Ramalina, 152
Ramularia, 129
Reticularia, 53
Rhabdospora, 140
Rhinodina, 152
Rhizina, 61
Rhizocarpon, 152
Rhizoctonia, 130
Rhizopogon, 121
Rhizopus, 57
Rhynchosporium, 130
Rhyparobius, 25, 61
Rhytisma, 64
Rosellinia, 71
Rostrupia, 87
Russula, 105

Saccharomyces, 145
Saccharomycetales, 44, 57
Saccobolus, 25, 61
Saprolegniales, 43, 55
Schizophyllum, 22, 106
Schizoxylon, 64
Scleroderma, 32
Sclerodermatales, 122
Sclerospora, 56
Sclerotinia, 63
Sclerotium, 130
Scodellina, 61
Scoleconectria, 69
Scolecotrichum, 22, 130
Scopularia, 130
Sebacina, 88
Secotium, 121
Sepedonium, 22, 131
Septocylindrium, 131
Septogloeum, 135
Septoria, 140
Solenia, 91
Sordariaceae, 25, 69
Sorosporium, 81
Spathularia, 58
Sphacelotheca, 81
Sphaeriaceae, 70
Sphaeriales, 10, 13, 16, 44, 69
Sphaerobolus, 25, 122
Sphaerographium, 144
Sphaeronema, 144
Sphaeronemella, 22, 144
Sphaeropsidales, 10, 13, 49, 135
Sphaeropsis, 144
Sphaerotheca, 19, 67
Spondylocladium, 131
Sporobolomyces, 44, 80
Sporodesmium, 131
Sporormia, 26, 70
Sporotrichum, 131, 146
Stagonospora, 145
Stemonitis, 53
Stereocaulon, 152
Stereum, 91
Stictis, 64
Stilbum, 131
Streptothrix, 131
Stropharia, 25, 114
Stysanus, 131
Syncephalis, 25, 57
Synchytrium, 55
Syzygites, 57

Tapesia, 63
Taphrina, 58
Tarichium, 23, 57
Teichospora, 71
Teloschistes, 152
Thamnidium, 57
Thelephora, 91
Thelephoraceae, 16, 46, 88

Thyridium, 77
Thyronectria, 69
Tilletia, 81
Tracya, 81
Trametes, 97
Tremella, 88
Tremellales, 87
Tremellodon, 88
Trichia, 54
Trichoderma, 131
Tricholoma, 106
Trichopeziza, 63
Trichophyton, 146
Trichosporium, 131
Trichothecium, 131
Trimmatostroma, 131
Trogia, 106
Tubaria, 113
Tuber, 44, 66
Tuberales, 66
Tubercularia, 131
Tubifera, 54
Tulostoma, 122
Tympanis, 63
Typhula, 92

Ulcolla, 88
Uncinula, 67
Underwoodia, 30, 58
Urceolaria, 152
Uredinales, 10, 13, 18, 45, 82
Uredinopsis, 87
Urnula, 61
Urocystis, 19, 30, 81
Uromyces, 19, 87
Uropyxis, 87
Usnea, 152
Ustilaginales, 45, 81
Ustilago, 81

Valsa, 77
Valsaceae, 76
Valsaria, 78
Valsella, 78
Venturia, 75
Vermicularia, 145
Verpa, 58
Verticillium, 131
Volutella, 131
Volvaria, 108

Xylaria, 80
Xylariaceae, 79
Xylographa, 152

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